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ABSTRACT

This book brings together in a convenient form a large amount of recent research on open classrooms. Pointing out that open education is more a philosophy than a set method, the book begins with an attempt to sketch the dimensions of the term. The chapter on recent evaluative research is especially helpful. A large number of studies are grouped by subject area and reviewed in a simple tabular format. Under "Academic Achievement," for example, are listed 58 studies, giving source, criteria for school selection, sample information, measures used, and results. Eight other areas of comparison (self-concept, attitude towards school, creativity, independence and conformity, curiosity, adjustment and anxiety, locus of control, and cooperation) are similarly dealt with. The conclusion, titled "Many Unanswered Questions," stresses the importance of continued careful evaluation to determine the best role for open education to play in the total educational environment. (Author/BP)

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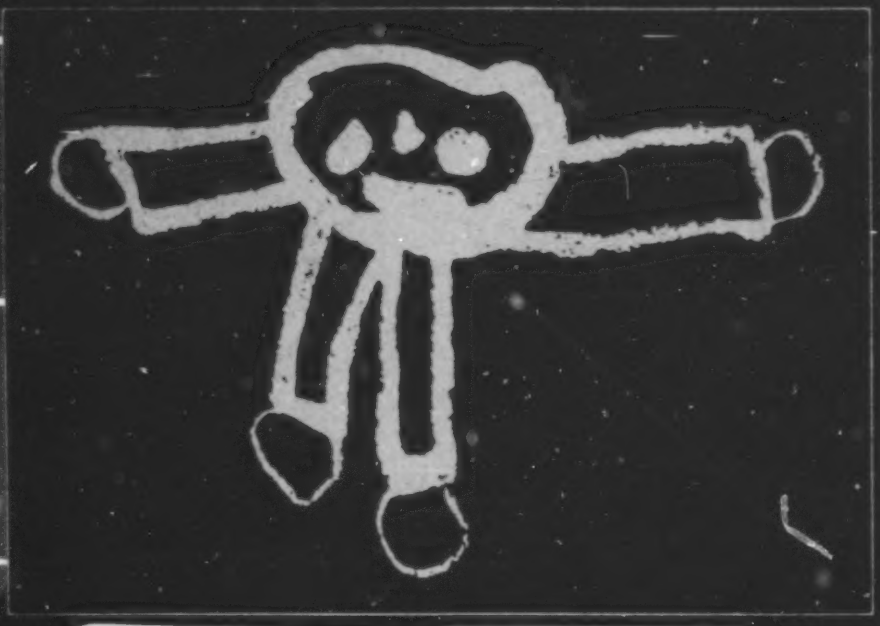

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PSYCHOLOGICAL EFFECTS OF OPEN CLASSROOM TEACHING ON PRIMARY SCHOOL CHILDREN: A REVIEW OF THE RESEARCH

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North Dakota Study Group on Evaluation
University of North Dakota
Grand Forks, N.D. 58202
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In November 1972, educators from several parts of the United States met at the University of North Dakota to discuss some common concerns about the narrow accountability ethos that had begun to dominate schools and to share what many believed to be more sensible means of both documenting and assessing children's learning. Subsequent meetings, much sharing of evaluation information, and financial and moral support from the Rockefeller Brothers Fund have all contributed to keeping together what is now called the North Dakota Study Group on Evaluation. A major goal of the Study Group, beyond support for individual participants and programs, is to provide materials for teachers, parents, school administrators and governmental decision-makers (within State Education Agencies and the U.S. Office of Education) that might encourage re-examination of a range of evaluation issues and perspectives about schools and schooling.

Towards this end, the Study Group has initiated a continuing series of monographs, of which this paper is one. Over time, the series will include material on, among other things, children's thinking, children's language, teacher support systems, inservice training, the school's relationship to the larger community. The intent is that these papers be taken not as final statements--a new ideology, but as working papers, written by people who are acting on, not just thinking about, these problems, whose implications need an active and considered response.

Vito Perrone, Dean
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Preface

Any effort to determine the effects of a learning experience on a child is wrought with difficulty. The burden of the task increases proportionately with the degree to which the process of gathering the evaluation report is separated from other aspects of the total learning process. It is assumed that those responsible for reporting evaluation and research realize this and realize, too, that their responsibility is ultimately to children. At least this understanding has been part of the discussion about evaluation for some time now. Not so clearly seen, however, is the relationship between evaluation and practice, and the fact that it is the practitioner, particularly the teacher, situated as she is between the research reporters and the children, who bears the larger burden. While it is often impossible and not necessarily desirable to trace any clear connection between a particular classroom practice and specific research findings, it seems safe to say that many classroom practices are influenced, directly or otherwise, by research evaluation. Most frequently, the route is circuitous. What teachers do with and for children may be influenced by their own childhood education and other life experiences, by mandates from on high, and by a complex combination of many other factors. But what seems to make the difference is the conscious effort on the part of teachers to bring about a mesh between the best that is known about how children learn and develop and the learning environment they provide for children. Herein lies the major value of open education. It is this, particularly, which distinguishes it from all formal or traditional approaches and the evaluations attending them. Open education recognizes the value of careful observation of children by teachers, ongoing assessment of their progress, and a vigilance that brings to bear on the most recent findings in child development and learning theory the teacher's own perceptions, based on her daily observations of the children's interaction with their environment. Once this is recognized, the difficulties embodied in evaluating open classroom teaching become apparent.

Obviously, the latter is easier said than done. James Macdonald may have given an accurate appraisal of evaluation when he wrote, "Evaluation is at present the major disaster area in education." But such disasters should encourage us to do better, not to walk away from the job. The review of the research on open classroom

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teaching that follows does just this by taking into consideration the complexity to which I refer so that it may be confronted, dealt with as an inherent ingredient of the phenomenon of open education, and thereby used to enlighten that phenomenon rather than to obscure it.

Many factors contribute to the complexity of evaluating open classroom teaching. As Horwitz points out, the concept of open education teaching itself is ambiguous. For one thing, it is more a philosophy of education than a set method or approach. Secondly, what teachers understand of the underlying philosophical framework is necessarily unique to their own personal meanings and perceptions. A further complication results from an external cause: the enshrinement in the educational establishment of objective, measurable standards as the only acceptable means of judging the value to children of an educational program. I suppose that standardized tests will be with us for a long time despite the many thoughtful and scholarly expositions published within recent times testifying both to their inadequacy and to their stultifying effect on the very process they purport to evaluate.

After extensive scrutiny of the research on open education, Horwitz reports that, academically, open education children do as well and sometimes better than children in traditional programs. The research reviewed in other areas such as self-concept, attitude toward school, and creative thinking, show, where there is a significant difference, that in most instances open classroom children are ahead. In all of his reporting, Horwitz points out that each study has severe limitations due to the ambiguity of the definitions of the concepts under investigation, measuring problems, and the inability to control variables. It is this oft repeated story which adds weight to the plea for alternative methods of evaluation and research. Any serious study of educational research, be it of traditional or informal programs, confirms that there is no final answer, no one way for all children, no ideal approach. When we face this inevitable fact, stemming from the phenomenon of the person, we may, finally, be in a position to take seriously our responsibility to perfect alternative methods of evaluation commensurate with that phenomenon. We know there is an alternative, but in very few instances has it been perseveringly tried.

In the meantime, the conclusions reached by Horwitz after an extensive survey of the research showing the effects of open classroom teaching on children are most significant. Open education teaching, he writes, "rarely appears to produce any measurable harm." On the other hand, of the thousands of traditional programs surveyed over the decades, including the "basics," one can almost always find contradictory results, one research finding nullifying the previous conclusion. In light of such findings, what can be gleaned from the cry, "back to the basics," other than nonsense? Horwitz's survey of open classroom

teaching creates an atmosphere where parents and teachers and opponents of open education can relax and give breathing space to those who, in their search for new ways of documenting the educational process--ways commensurate with the nature of the person and the process of learning, can continue to observe children, be reflective about it, dialogue, and reassess their judgments in the light of the gradual, continuous unveiling of the human phenomenon of learning.

Regardless of one's attitude toward open education, it certainly must be realized that open education is a force to be reckoned with. Highly charged emotional attacks and counterattacks are not productive. If one is intent on the continuous renewal of education (and renewal implies continuity)--that is, if one is truly interested in decreasing the gap between what we know about the nature of the person and what we provide for children in our schools--then the furor will subside and be replaced by a quiet, diligent, scholarly search for that which will make schools more responsive to the total needs of children.

Catherine Molony

Introduction

Since the first descriptive reports of the progressive teaching approach in English primary schools appeared in the American press in the mid-1960s, there has been a vast outpouring of literature on what has come to be called 'open education,' or the 'open classroom.'

Many of the early reports (e.g., Blackie, 1967; Brown and Precious, 1969; Central Advisory Council, 1967; Featherstone, 1967; Hull, 1970; I/D/E/A, 1969; *Informal Schools in Britain Today*, 1971; Kallett, 1966; Marsh, 1970; Murrow and Murrow, 1971; Ridgway and Lawton, 1968; Rogers, 1970; Yeomans, 1967) provided rich and vivid descriptions of what was going on in the English schools and stressed how much more humane and more sensitive to realities of child development this approach to teaching seemed to be. Later works (e.g., Barth, 1972; Devaney, 1974; Eisner, 1974; Fisher, 1972; Grannis, 1973; Rathbone, 1970, 1971; Silberman, 1970; Spodek, 1970; Weber, 1971) began to analyze the open education movement in the context of its historical precedents and psychological/philosophical underpinnings and to compare the development of the approach in England and the United States. Other writings, with a more practical orientation, provided specific advice on how to implement open education in American schools (e.g., Hassett and Weisberg, 1972; Hertzberg and Stone, 1971; Kohl, 1969; Nyquist and Hawes, 1972; Silberman, 1973; Stephens, 1974; Taylor, 1972; Thomas, 1975).

What is the 'open classroom'? For more than 30 years, English teachers have been developing an approach to teaching--variously described as 'informal schooling,' the 'integrated day,' or the 'open classroom'--which, to the observer, looks vastly different from the 'traditional' approach to educating children. Rather than the usual straight rows of student desks, the open classroom is set up as a kind of workshop, with tables, work benches, and activity areas stocked with a multitude of materials for children's use. Art work, construction, graphing, mapping, and writing are encouraged and the children's products displayed prominently around the room. Children are allowed to move about freely, working independently or in small groups on projects dictated by their own interests and individual needs. The teacher is there to guide and instruct, but children are expected to take initiative and assume responsibility for their own learning. The emphasis is on informality, activity, creativity, learning through experience, and meaningful integration of subject areas. The aim

Robert A. Horwitz is a co-founder of the New Haven, Connecticut Teacher Center. He spent the academic year of 1973-74 in England visiting primary schools and conducting research on psychological effects of the open classroom. In 1975-76 he was pre-doctoral fellow of psychology in psychiatry at the Yale Medical Health Center. He is now Clinical Psychologist at ACUTE in Connecticut. This monograph was written with support from the Social Science Research Council, the Concilium on International and Area Studies, and the Institution for Social and Policy Studies.

is not merely to 'process' children through a pre-planned curriculum, but to build on their own interests, to get them excited about the world around them, and to help them develop the skills and attitudes they need to continue learning on their own.

As the interest in the open classroom has grown in the United States, demands for systematic evaluative research on its effects have increased. As Rogers (1970) has pointed out, the enthusiasm with which observers have described what they have seen in the informal English primary schools may be inspiring, but it is not always enough to persuade a school system or an individual teacher to make the major changes involved in moving towards open education. Rogers writes:

> Those of us fortunate enough to have visited a good British primary school recognize almost intuitively that what we are seeing is mostly right, mostly effective, mostly sound. On the other hand, many educators have a way of asking questions that cannot be answered adequately by referring to one's personal observations. How, in fact, do children in such schools perform on various objective measures when compared to children who have had quite a different sort of school experience? Obviously, academic achievement is not the basic goal of such schools, but since it is not, what effects do these schools have on children's attitudes towards school, teachers, and peers? How does this experience affect their approach to learning, the problem-solving strategies they adopt, their persistence, their curiosity? The non-disciple deserves answers to these questions and to many more (p. 297).

While a fairly large number of evaluation studies--particularly in doctoral dissertations--have been carried out in the years since Rogers wrote that statement, research has by no means provided a clear answer to the question of whether or not the open classroom is significantly more beneficial to children than more traditional teaching approaches. Part of the reason for this is the fact that conflicting findings have emerged for most of the variables which have been assessed. Another reason is that many variables considered important by advocates of open education have not yet been adequately evaluated because of problems in measurement. Perhaps the most important reason, though, lies in the ambiguity surrounding the definition of the 'open classroom' approach. Unlike a behavior modification system, a curriculum package, or a clearly defined teaching style (e.g., the 'lecture method'), open education is, by definition, a flexible, 'open-ended' approach to the teaching-learning process, influenced in large part by the particular characteristics of the children and teachers involved. As a result, the nature of teaching which occurs

in various classrooms described as 'open' is by no means uniform. Silberman (1970) has accurately characterized open education as "less an approach or method than a set of shared attitudes and convictions about the nature of childhood, learning, and schooling" (p. 208). Of course, the attitudes and convictions to which Silberman refers necessarily imply at least a range of specific teaching strategies, methods of classroom organization, and student-teacher relationships which could be included under the general rubric of open education. Were this not the case, any meaningful evaluation of the open classroom would be impossible. In reading evaluative research on open classrooms, however, it is not always clear what the word 'open' meant to the researchers or to the teachers involved in their studies. 'Open space,' 'open plan,' 'open concept,' 'open area,' 'open climate'--these are just a few of the terms which have been used to describe 'open' school programs. Sometimes a writer appears to be concerned primarily with architecture and physical layout of classrooms; other times with organizational features such as 'individualization,' 'team teaching,' 'non-gradedness,' or 'vertical grouping;' other times with a broader philosophical/educational rationale. In making sense out of the existing research on open education, then, one must be careful to avoid making assumptions that the kinds of classrooms described as 'open' in fact have a great deal in common with each other.

Whatever lack of consensus about the definition of 'open classrooms' there may be in the studies to be reported in this paper, however, it is important to emphasize that a number of very thoughtful and comprehensive attempts have been made to describe the basic features which constitute open education.

1

The Dimensions of 'Open' Education

Based on a large number of classroom observations and a survey of the literature commonly referred to by open classroom teachers, Rathbone (1971) identified an "implicit rationale" of the open classroom, covering six basic areas: how children learn, the nature of knowledge, the function of schooling, the teacher's role, the psycho-emotional climate, and the moral context. Among Rathbone's major points are these:

How children learn

Rather than "a passive vessel waiting to be filled," the child is viewed as "an active agent in his own learning process...a maker of meaning, an organizer of experience."

Direct experience is considered central to the learning process; the child learns best when given freedom to explore...with a minimum of direction from others."

Important conceptual formulations can occur in what might appear as "aimless dabbling." (pp. 100-101)

The nature of knowledge

"Knowledge is idiosyncratically formed and conceived, fundamentally individualistic;" it is "not inherently ordered or structured, nor does it automatically subdivide into academic disciplines."

By implication: the child is "capable of...learning ...from nearly any responsive element in his environment." Also, "material originally selected for the purpose of teaching (one subject area) may unexpectedly extend a child's understanding (in another)." (pp. 101-103)

The function of schooling

"School...is a social institution designed to facilitate learning...through presentation of...situations through which children may easily and pleasantly...learn."

The function of school is "to offer and suggest, not only to inform and instruct some predetermined corpus of knowledge ... to encourage exploration, to help children acquire competence at self-selected tasks, to facilitate ...children's learning to learn."

Demands for academic performance should be balanced against "goals of developing independence, self-reliance, autonomy, trust, self-confidence, (and) responsibility." (pp. 104-105)

The teacher's role

Teaching is seen as "a lateral interchange, a transmission not *from* superior *to* inferior, but rather *between* two persons."

"Open education de-emphasizes the view of teacher as instructor, possessor of special knowledge, transmitter of answers, filter or mediator between materials and learner, determiner of curriculum, orchestrator of large groups of children, evaluator, standard setter; it emphasizes, on the other hand, teacher as trained observer, diagnostician of individual needs, presenter of environments, consultant, collaborator, flexible resource, psychological supporter, general facilitator of...learning." (p. 106)

The psycho-emotional climate

The classroom should "foster affective as well as social and cognitive growth." It should be "a place of trust and openness (in which) feelings are aired freely (with) mutual respect and...toleration of difference."

Unlike more "rigid, achievement-oriented" classrooms, the open classroom should be characterized by the absence of a "pressure-cooker atmosphere," a "de-emphasis of competition among peers," an acceptance of error and fantasy as "normal...part(s) of the learning process."

Children are assumed to have "the capacity to work out their conflicts and anxieties within a group of classmates." (pp. 108-111)

The moral context

The child should be treated "with courtesy, kindness and respect" and valued "as a human being (with) rights no less valid than an adult's."

Childhood is held to be "a good and natural stage of life," and the school environment adapted to meeting "the immediate needs of the child" rather than "accelerating his progress through (developmental) stages."

The child's right to "direct much of his own learning" is respected, but it is the teacher's responsibility to "articulate ethical dimensions of classroom work" to the child. (pp. 112-114)

Another effort to describe the basic ingredients of open education has been made by Barth, who, in a series of writings (Barth, 1968, 1969, 1971, 1972) has refined a list of "assumptions about learning and knowledge" underlying the open classroom. Barth claims to have "tested" his "assumptions" with "over a dozen British primary teachers, headmasters, and inspectors" and "a number of American proponents of open education" and found them generally acceptable (1972, p. 18). Several studies have now used agreement with Barth's assumptions as an attitudinal measure of support for the open classroom approach. The assumptions, derived from an extensive literature survey, fall under six categories, and are as follows:

ASSUMPTIONS ABOUT CHILDREN'S LEARNING

Motivation

1. Children are innately curious and will explore without adult intervention.

2. Exploratory behavior is self-perpetuating.

Conditions for learning

3. The child will display natural exploratory behavior if he is not threatened.

4. Confidence in self is closely related to capacity for learning and for making important choices affecting one's learning.

5. Active exploration in a rich environment, offering a wide array of manipulative materials, facilitates children's learning.

6. Play is not distinguished from work as the predominant mode of learning in early childhood.

7. Children have both the competence and the right to make significant decisions concerning their own learning.

8. Children will be likely to learn if they are given considerable choice in the selection of the materials they wish to work with and in the choice of questions they wish to pursue with respect to those materials.

9. Given the opportunity, children will choose to engage in activities which will be of high interest to them.

10. If a child is fully involved in and having fun with an activity, learning is taking place.

Social learning

11. When two or more children are interested in exploring the same problem or the same materials, they will often choose to collaborate in some way.

12. When a child learns something which is important to him, he will wish to share it with others.

Intellectual development

13. Concept formation proceeds very slowly.

14. Children learn and develop intellectually at their own rate, and in their own style.

15. Children pass through similar stages of intellectual development--each in his own way, and at his own rate and in his own time.

16. Intellectual growth and development takes place through a sequence of concrete experiences followed by abstractions.

17. Verbal abstractions should follow direct experience with objects and ideas, not precede them or substitute for them.

Evaluation

18. The preferred source of verification for a child's solution to a problem comes through the materials he is working with.

19. Errors are necessarily a part of learning; they are to be expected and even desired, for they contain information essential for further learning.

20. Those qualities of a person's learning which can be carefully measured are not necessarily the most important.

21. Objective measures of performance may have a negative effect on learning.

22. Evidence of learning is best assessed intuitively, by direct observation.

23. The best way of evaluating the effect of the school experience on the child is to observe him over a long period of time.

24. The best measure of a child's work is his work.

ASSUMPTIONS ABOUT KNOWLEDGE

25. The quality of being is more important than the quality of knowing; knowledge is a means of education, not its end. The final test of an education is what a man is, not what he knows.

26. Knowledge is a function of one's personal integration of experience and therefore does not fall neatly into separate categories or 'disciplines.'

27. The structure of knowledge is personal and idiosyncratic, and a function of the synthesis of each individual's experience with the world.

28. There is no minimum body of knowledge which is essential for everyone to know.

29. It is possible, even likely, that an individual may learn and possess knowledge of a phenomenon and yet

be unable to display it publicly. Knowledge resides with the knower, not in its public expression.

While Rathbone's and Barth's analyses provide useful insight into the values, beliefs, and theoretical notions underlying the open classrooms, they still leave unspecified some of the important facets of what an open classroom actually looks like and how it actually functions.

Katz (1972) has specified six dimensions of classroom practice on which "open-informal" classrooms can be distinguished from more "formal-traditional" classrooms:

1. *Use of space.* In the open classroom, "the use of space and the movement of persons, materials and equipment within it, is less routinized, fixed or invariable."

2. *Range of children's activities.* "The range of encouraged and permitted activities is wider, less fixed or bounded, more open-ended," and "child-child interaction (is less) restricted."

3. *Origin of activity.* "Children's activities (are more likely to) be pursuits, extensions or elaborations of their own spontaneous interests, rather than activities selected by teachers or others."

4. *Breadth of content.* "The range of topics or content to which children's attention and energy are guided is both wider and more open-ended."

5. *Use of time.* "Time for specified categories of classroom activities is more flexibly assigned."

6. *Nature of teacher-child relationship.* (a) *Initiation:* "Teacher-child interactions are (more) likely to be initiated by the children as (often as) by the teacher." (b) *Teaching target:* "The teacher is more likely to work with individual children than with large groups, less (likely to) address the whole group as an instructional unit, (and) more likely to be seen giving suggestions, guidance, encouragement, information, directions, feedback, clarification, and/or posing questions, primarily during individual teacher-child encounters." (c) *Discipline:* "The teacher's response to undesirable behavior is (more) likely to be to offer the child an interpretation of his actions in terms of the classroom group's life and its moral as well as functional implications, and she is (less) likely to ignore the behavior or to exact punishment." (d) *Academic standards:* But the open classroom teacher is no less likely "to emphasize appropriately high standards of work."

A still more detailed delineation of the dimensions

on which open and traditional classrooms differ has been described by Traub, Weiss, Fisher and Musella (1972), who constructed a 30-item *Dimensions of Schooling Questionnaire* (DISC) as part of a large-scale evaluation of open classroom teaching in Canada. The DISC focuses on ten aspects of school life: (1) instructional objectives; (2) materials and activities; (3) physical environment; (4) decision-making; (5) time scheduling; (6) individualization of instruction; (7) composition of classes and student groupings; (8) the role of the teacher; (9) student evaluation; and (10) student control. In a multiple choice format, it asks teachers to rate the degree of congruence between descriptions of various school procedures and the actual situations prevailing in their own classrooms. Among the classroom procedures included in the questionnaire are the following:

1. Who makes decisions about student assignment to teachers? (students/parents/teachers/principal)

2. How much of the school day is blocked into pre-scheduled activities?

3. How much of the school is available for students to pursue their own interests?

4. Who makes the rules which govern school behavior? (principal/teachers/parents/students)

5. Who enforces the rules for student conduct? (principal/teachers/parents/students)

6. Who defines the general objectives of school? (administration/teachers/parents/students/no one)

7. How much freedom do students have to move around the school?

8. To what extent are students and teachers personally involved in the development of materials for the classroom?

9. How involved are students in selecting materials with which to work?

10. Who decides upon arrangement of furniture and equipment in the learning area? (administration/teachers/students)

11. In how wide an area do students' learning activities occur? (own desk/different centers within the classroom/different places within the school/outside the school)

12. To what extent are adults other than teachers involved in teaching? (parents/volunteers/visitors)

13. To what extent do students work with other students on schoolwork?

14. To what extent are media (e.g., films, records) used to augment teachers and books, and to what extent are students free to use these media themselves?

15. How large a group does the teacher generally address at one time? (whole class/subgroups/individual students)

16. What is the teacher's role? (resource person/discussion leader on student- or teacher-initiated topics/presenter of planned lessons)

17. To what extent do teachers plan and teach together in the school?

18. To what extent are students assigned or allowed to choose or formulate their own methods of learning and solving problems?

19. At what pace is the student expected to work? (pace set for the class/pace set for his subgroup/pace prescribed for him individually/self-determined pace)

20. At what proportion of the class's activities is each student's attendance required?

21. How much time is available for independent study?

22. How are subgroups within the class developed? (by students themselves/by teacher on basis of information about students/by teacher randomly)

23. For how long are subgroups established and when are they changed?

24. How wide a range of age exists within the class?

25. Who specifies the objectives of schooling within each subject area? (administration/teachers/parents/students/no one)

26. When, if ever, are decisions made to promote students from class to class? (end of school year/end of unit of study/whenever appropriate for the individual/never --students remain in intact class for several years)

27. How alike are evaluation procedures for different students in the school?

28. How frequently does evaluation occur?

29. To what extent are students involved in planning their evaluation?

30. What sort of evaluation instruments are used? (commercially-produced/school-developed/teacher-constructed/no formal instruments--evaluation based on work samples and anecdotal reports)

In a factor analysis study of more than 400 teachers' responses to the DISC, Traub et al. identified six clusters of items characteristic of the most open school programs:

1. *Individualization of instruction.* (students choose own learning materials and methods of study and set their own pace for using them; teachers operate primarily as resource persons, addressing small groups of students).

2. *Student independence.* (students have a lot unstructured, independent study time; classroom time structure is flexible; students choose own instructional materials and play active role in planning and implementing evaluation procedures).

3. *Environmental flexibility.* (instructional settings are provided in the community as well as in the classroom; a variety of media of instruction are utilized).

4. *Nongradedness.* (classrooms are multi-age groups; "promotion" takes place at any time during the school year).

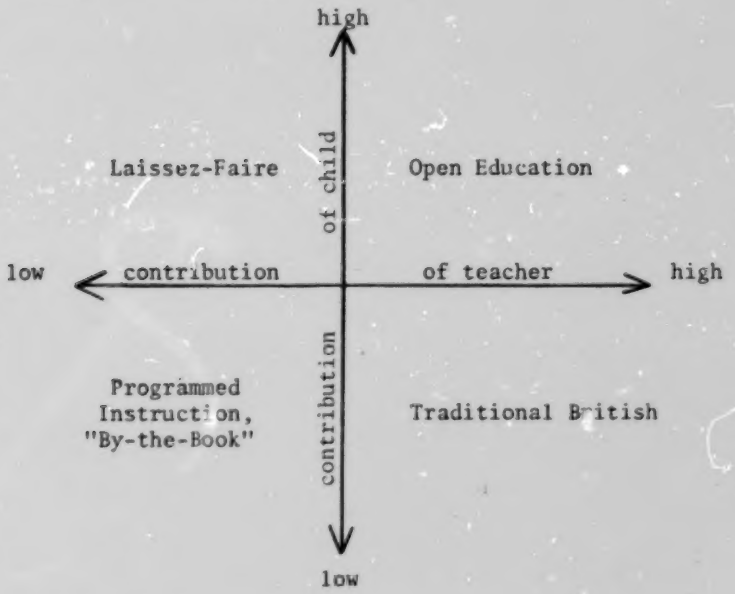
5. *Flexibility of student evaluation.* (student evaluation occurs frequently, with procedures varying from student to student).

6. *Flexibility of curricular materials.* (a diversity of materials are available, and curricular objectives are defined by persons in the classroom, as opposed to textbook writers, administrative officers, etc.).

While the Traub et al. (1972) instrument for identifying open classrooms comes closer than either the Rathbone or Barth analyses to describing the actual behavior of teachers and pupils in open classrooms, it has been justly criticized by Bussis (1973) for its lack of a philosophical context. While the DISC may provide clues about the structure and organization of an open classroom, it says little about its underlying rationale.

Among the more thoughtful attempts to place open education into a conceptual framework is Bussis and Chittenden's (1970a) *Analysis of an Approach to Open Education.* One of the important notions presented in that paper is that open classrooms are not simply more child-centered than other

classrooms. In place of the popular notion of a linear continuum which has, at one extreme, "a classroom completely controlled by the teacher and organized around formal curricular requirements" and, at the other extreme, "a classroom in which the children are theoretically setting the entire course of learning" (p. 20), they propose a four-quadrant grid on which open classrooms are seen as *both* child-centered and adult-centered:



In this classification scheme, the degree to which the individual *teacher* actively contributes to decisions regarding the content and process of learning is a dimension independent of the degree to which the individual *child* contributes to those decisions. In the lower right-hand quadrant is what Bussis and Chittenden call the "traditional British" classroom, in which the teacher takes a very active role in developing and presenting curriculum but the children have little say about what they will do. In the lower left-hand quadrant is the sort of classroom in which neither the teacher nor the child has much say in what happens, but the teacher functions primarily as a conveyor of a curriculum devised by other people; this sort of classroom, quite common in American schools, is dominated by teacher's manuals, programmed materials, and textbooks. The upper-left hand quadrant represents the "laissez-faire" or "free school" approach, in which "the adult plays a very supportive but entirely nondirective role, the children having great freedom which occasionally erupts into chaos" (p. 22). Children are given a wide range of choices and

are encouraged to take responsibility for their own learning in the open classroom (upper-right hand quadrant) as well, but what is different is that the teacher also is actively involved in determining the goals, materials and activities of the classroom. Although the interests and concerns of the child are central to the open classroom approach, Bussis and Chittenden stress that "it is certainly not true that the...teacher (functions as) some kind of unobtrusive valet who attempts to foresee and attend to every need...Good (open) classrooms bring active adults together with active children" (p. 21). Open classroom teachers actively select materials and equipment, make suggestions, diagnose, question, and appraise; they actively express their own interests as well as responding to the children's.

Bussis and Chittenden describe 10 major characteristics of the 'open teacher:' two relating to the teacher's "internal frame of reference" (i.e., ideas about children, the learning process, and self); three having to do with teacher activities engaged in when children are not present (i.e., provisioning the classroom environment, evaluating and reflecting on children's work, seeking activity to promote personal growth); and five dealing with aspects of the teacher's actual interactions with children (i.e., diagnosis, extension of learning, honesty of encounters, respect, and warmth). (p. 31)

In an effort to design a systematic observation scale suitable for assessing the degree of 'openness' in classrooms, Walberg and Thomas (1971, 1972, 1974, 1975) condensed Bussis and Chittenden's list of characteristics into eight basic open education themes:

1. *Provisioning for learning.* Flexibility in organization of instruction; great diversity of materials; children allowed to move freely, talk among themselves, form their own groups.

2. *Diagnosis of learning events.* Less emphasis on giving tests and correcting papers than on closely observing children's work and asking experience-based questions.

3. *Instruction, guidance and extension of learning.* Instruction based more on individual children than whole-class lessons; subject areas are integrated in children's work.

4. *Evaluation of diagnostic information.* Individual standards preferred to comparing the child to standardized achievement norms; teacher-kept notes and samples of children's work used in evaluating growth.

5. *Humaneness.* Teachers have characteristics such as respect for children, openness, and warmth; children's activities and products are valued and displayed in the classroom.

6. *Seeking opportunities to promote growth.* Teachers use community, colleagues, advisors to assist their own development.

7. *Assumptions about children and the learning process.* Children are assumed to be innately curious, capable of making responsible decisions, etc.; clear guidelines and an accepting emotional climate are considered essential for facilitating learning.

8. *Self-perception of the teacher.* Teacher sees self as a learner and as one of many resources for helping children reach their potentials; feels comfortable allowing children to take initiative and be independent.

An initial list of 106 statements drawn from open education literature and expanding upon these themes was constructed, submitted to a panel of well-known open educators (writers and practitioners), and then revised. What emerged, finally, was a 50-item classroom observation rating scale (together with a parallel 50-item teacher questionnaire, identical to the observation scale except for slight changes in wording). This scale was submitted to a validity test in over 60 English and American classrooms (Evans, 1971; Walberg and Thomas, 1972, 1974, 1975) and was shown to successfully discriminate between classrooms reputed to be 'open' and classrooms held to be 'traditional.' It has since been used in numerous studies undertaken to evaluate effects of 'open classroom' vs. 'traditional' teaching.

Similar classroom rating scales and procedures have been developed by Applebury and Hay (1969), Brandt (1972a, 1972b, 1975), Dopyera (1972), Dopyera and Lay (1975), Evans (1975), Gardner and Cass (1965), Myers and Duke (1973), Resnick (1972), Ross and Zimiles (1971, 1974), Troutt (1972), Tuckman, Cochran and Travers (1973), Winett and Edwards (1974), and Ziskind (1975). Other writers, including Flurry (1972) and Nias (1974), have, without producing formal instruments, endeavored to come up with lists of the distinguishing characteristics of open classrooms. But despite such efforts to itemize the essential features of open education, there remains in the literature, in school practice, and in many of the evaluation studies which have been done, a disturbing amount of vagueness, ambiguity, and contradiction about what the term 'open classroom' means.

Open education, to be sure, is not a straightforward, simple concept. It is multi-dimensional and has its roots in a number of disparate traditions--including the philosophical traditions of Rousseau (Archer, 1964) and Dewey (e.g., Dewey, 1902-1915/1956, 1916/1966, 1938/1963; Archambault, 1964), the psychological traditions of Piaget (e.g., Piaget, 1964/1967, 1969/1970; Piaget and Inhelder, 1966/1969; Athey and Rubadeau, 1970; Brearley, 1970; Furth,

1970; Ginsburg and Opper, 1969; N. Isaacs, 1972; Schwebel and Raph, 1973) and Susan Isaacs (1929/1968, 1930/1966, 1932/1971, 1937/1972; 1948/1970); the historical traditions of the progressive education era in the U.S. and the post-World War II thinking about children in Great Britain; the writings of contemporary 'radical school reformers' (Gross and Gross, 1969) such as Dennison (1969), Goodman (1960, 1964, 1969), Holt (1964, 1967, 1969, 1970), Kohl (1967, 1969), Kozol (1967, 1969), and Neill (1960); the educational practice of Montessori (1912/1964) in Italy, Ashton-Warner (1963) and Richardson (1964/1969) in New Zealand, and, of course, the British infant schools. It represents a complex confluence of history, philosophy, psychology, architecture, and teacher innovation. And, by virtue of its complexity, it lends itself quite easily to misunderstanding and over-simplification.

As Myers (1973) has pointed out, there has been a tendency in the United States to adopt innovations without careful thought, to profess to adopt without really changing, and to adopt but misinterpret. This tendency certainly has been apparent in the open classroom 'movement' in this country. 'Open education' has become a faddish slogan, sometimes employed rather carelessly, in spite of all the published attempts at specifying its meaning. Needless to say, the inconsistency surrounding the definition of open education seriously complicates the task of understanding the evaluative research--a point which will be touched on again later.

2

Evaluations of 'Progressive' Practice: 1930s-1950s

Before summarizing the more recent evaluative studies on open education which have been carried out in the U.S., Canada, and Britain, mention should be made of the substantial body of research which was undertaken during the 'progressive education' era of the 1930s and 1940s in this country, as well as of the research conducted by Bank Street College and by D.E.M. Gardner in England.

The descriptions of the better of the 'progressive era' schools (e.g., Cremin, 1961; Dewey and Dewey, 1915/1962; Gordon, 1946/1970; Mayhew and Edwards, 1936/1966; Pratt, 1948/1970; Wrightstone, 1938) make it clear that, in many ways, they closely resembled the British infant schools which inspired the American 'open classroom' approach. (The recognition of this resemblance prompted the National Association for the Education of Young Children to sponsor a conference titled "Open Education: The Legacy of the Progressive Movement") (Spodek, 1970). Since their appearance in the years following World War I happened to correspond with the burgeoning development of the tests and measurements field, a large number of studies were undertaken to quantitatively assess the impact of progressive schooling on children.

One particularly noteworthy research project evaluating the 'activity program' in the New York City public elementary schools was reported in a series of eight articles in the *Journal of Experimental Education* in 1939 and 1941 (Jersild, Goldman, Jersild, and Loftus, 1941a, 1941b; Jersild, Goldman, and Loftus, 1941; Jersild, Thorndike, Goldman, and Loftus, 1939; Jersild, Thorndike, Goldman, Wrightstone, and Loftus, 1941; Sells, Loftus, and Herbert, 1941; Thorndike, Loftus, and Goldman, 1941a, 1941b). Among the results obtained were these: 'activity school' children scored slightly lower than the control group in reading and arithmetic achievement tests, but surpassed the controls in tests of knowledge of current affairs, progressive social beliefs, personal adjustment and social adjustment; in observational studies, the activity school group also showed more evidence of initiative, experimentation, criticism and appraisal of one another's work, cooperation, and leadership than the control students, while scoring substantially similar to the controls in ratings relating to classroom conduct and discipline.

Summarizing research studies from across the country, the Progressive Education Association's Informal Committee

on Evaluation of Newer Practices in Education reported the following general findings:

> In general...where schools have adopted newer educational practices the children learn as much of the ordinary school subjects as they would otherwise have learned. Sometimes they learn slightly less and sometimes slightly more, but the differences are small. In the early grades of the elementary school the children may not read so well when newer practices are used. This...is due to the practice of postponing certain aspects of reading until the end of the first year of elementary school. This inferiority gives way to a definite superiority in the upper grades. Those children who have attended schools where the newer practices prevail seem better adjusted both to their work and to social life when they graduate to other schools or to college. In general, the evidence shows convincingly that the new methods do not result in a loss of academic proficiency in the usual school subjects, and that, where any measures have been applied, there is a definite gain in terms of initiative, skill in dealing with problems, knowledge of contemporary and world affairs, and social participation (Baker et al., 1941, pp. 52-53).

Similar general findings were reported in the reviews of research compiled by Wrightstone (1938), Leonard and Eurich (1942), and Wallen and Travers (1963).

THE BANK STREET AND GARDNER STUDIES

By far the most comprehensive single study of psychological effects of 'modern' vs. 'traditional' teaching methods in American schools was the Bank Street College of Education report (Minuchin, Biber, Shapiro, & Zimiles, 1969) based on data collected from fourth-grade children in four New York City schools in 1956-58. At that time--after many of the progressive era innovations had disappeared and before the influx of ideas from the British infant schools--it was difficult to find examples of 'progressive' or 'informal' teaching practice. The Bank Street researchers, who designed their study to assess the impact on nine-year-old children of schools varying on a continuum from very 'traditional' to very 'modern,' had to settle for a rather unusual and expensive private school for their most 'modern'--a necessity which created serious methodological problems and limited the generalizability of their findings, since the other three less progressive schools were all ordinary, neighborhood, middle class, public schools. (Michael Wallach, 1971a, 1971b, is especially critical of this sampling problem in his two-part review of the book in the *Harvard Edu-*

cational Review, as is James Hedegard, 1972, in the *Merrill-Palmer Quarterly*.) However, the Bank Street study remains an important contribution to our understanding of school effects on children, particularly because of its detailed, systematic descriptions of the school environments, its consideration of the influence of parental child-rearing ideologies and practices, and the broad range of cognitive and personality variables it investigates.

Because of the large number of dependent measures and the confounding influences of home and parental factors, the findings of this study are complex and difficult to summarize. Generally, there were no significant differences between 'modern' and 'traditional' schools in group tests or academic achievement or in individual problem-solving tasks, including tests of imaginative thinking. However, children from the more 'modern' or 'open' schools tended to have more "differentiated" self-concepts--that is, they tended to describe and assess themselves in less rigid, more subtle and thoughtful ways; they were more invested in their childhood status and less future-oriented; they had more open, less conventional or stereotyped conceptions of their social sex roles. In group problem-solving, the 'open' school children were more cooperative, less competitive and, in the end, more effective. 'Open' school children also had much more positive attitudes toward school.

Although suffering from even more methodological flaws than the Minuchin et al. study, the most important long-term investigation of effects of 'open' or 'informal' teaching methods to come out of England was the research carried out over some three decades by D.E.M. Gardner of the University of London Institute of Education and summarized in her books, *Testing Results in the Infant School* (Gardner, 1942), *Long Term Results of Infant School Methods* (Gardner, 1950), and *Experiment and Tradition in Primary Schools* (Gardner, 1966). While, by present standards, the Gardner studies seem statistically unsophisticated, they nonetheless represent a significant attempt at quantitatively assessing both the beneficial and deleterious effects of 'informal' teaching which had previously been the subject of conjecture by the critics or proponents of 'progressive' education.

As with the Bank Street study, the findings are complex. 'Experimental' and 'control' schools were compared in pairs, rather than pooling the subjects, and results for each variable are presented in terms of how many pairs of schools showed superiority for the 'experimental' school--a confusing procedure. Many pairs of schools were tested on only a few of the variables, further complicating the overall results. Schools were tested in different years and by many different examiners. Different measures of the same variable were used with different age groups. However, the general pattern of findings tends to corroborate the American research results: little consistent difference between 'progressive' and 'traditional' schools on

measures of academic achievement and numerous advantages for the 'progressive' schools on other variables, including some skills and characteristics on which traditional schools are generally believed to place heavier emphasis. In tests administered in the last year of junior school, for example (age 10 to 11), the informal school children scored significantly higher in descriptive and expressive writing; free drawing and painting; listening and remembering; neatness, care and skill; ingenuity and inventiveness; and breadth and depth of out-of-school interests. The informal schools also showed some superiority (though apparently not statistically significant) in reading ability, ability to concentrate on an uninteresting task, moral judgment, general information, handwriting, and group cooperation and problem-solving. The only area in which the more formal traditional schools showed superiority was arithmetic.

Since the appearance of the Minuchin et al. and Gardner books, the evaluative research studies on 'open' classrooms which have appeared have all been more modest in scope, but there have been a great many of them. As was pointed out earlier, it is not always clear in these studies precisely what type of classroom was being evaluated, even though the label 'open' was used. In many of them, the children studied were attending 'open space schools, which *may* have been designed to accommodate an 'open education' philosophy but may in fact have been the locus of fairly conventional teaching. This writer has clear memories of visiting such 'open' schools, built at enormous expense and with a great deal of fanfare, only to discover the same old workbooks, teacher-directed lessons, and highly structured, tightly scheduled school day operating in actual practice. A large-scale investigation is currently being undertaken in England (Andreae, personal communication, August 1975) to assess the functioning and impact of such open space schools in that country. It is clearly recognized by the investigators in that research that 'open plan' architecture is not necessarily synonymous with 'open education' (i.e., even though *some* very fine open classrooms do happen to be in 'open space' buildings, others function in quite ordinary, traditionally partitioned structures). Such recognition is sorely missing on the American scene.

3

Recent Evaluative Research

In this section, I have made an effort to summarize the recent evaluative research on *open schools*, even though it is likely that many of the schools described as 'open' were, in fact, not functioning in ways consistent with Barth's assumptions or any of the other conceptual definitions of 'open education.' Barth (1972) has pointed out quite eloquently that 'openness' in open education refers to several different aspects of the teaching/learning process:

> Space is fluid, not preempted by desks and chairs organized in rows or in any permanent way; a variety of spaces are filled with a variety of materials. Children move openly from place to place, from activity to activity. Time is open, to permit and release rather than constrain or prescribe. The curriculum is open to choices by adults and children... Perhaps most importantly, open education is characterized by an openness of self on the part of children and adults. Persons are openly sensitive to and supportive of other persons, not closed off by anxiety and threat. Feelings are exposed and respected. Teachers are open to the possibilities inherent in children; children are open to the possibilities inherent in other children, in materials, and in themselves (p. 55).

None of these types of openness is as easy to observe and measure as the openness (i.e., lack of interior walls) of a school building. Many researchers have, therefore, been content to describe the school as open by virtue of its architecture and leave to the reader's imagination the task of determining whether anything else was actually open in the school. This is an unfortunate state of affairs, but a reality. Whenever possible, in reviewing the recent studies, I have mentioned the criteria used to determine openness. The studies are grouped according to outcome variables.

ACADEMIC ACHIEVEMENT

Of all the variables that have been investigated in open classroom evaluation studies, the one which has received the greatest amount of attention is academic achievement.

Table 1: ACADEMIC ACHIEVEMENT

	Study	*Criteria for School Selection*	*Sample*	*Measures*	*Results*
1.	Barker Lunn (1970)	"Streamed" (ability grouping; knowledge-centered" teaching) vs. "non streamed" (mixed ability grouping; "child-centered" teaching)	5.521 children in 36 streamed and 36 non-streamed junior schools in England (age 7+ to 11+)	N.F.E.R. Tests of English, Reading, Mechanical and Problem Arithmetic, Number Concept, Verbal and Non-Verbal Reasoning	No consistent differences
2.	Biggs (1967)	"Activity methods" vs. traditional methods	Junior school children in England	N.F.E.R. Concept Test (mechanical and problem performance in mathematics)	Traditional better
3.	Black (1974)	"Open Area" vs. "traditional learning environment"	360 Grade 4 children in 6 Open Area and 6 Traditional schools	Metropolitan Achievement Tests	No significant differences
4.	Broward County School Board (1972)	"Innovative open plan" vs. traditional schools	Grades 3, 5, and 8; Broward County, Fla.	California Test of Basic Skills	Mixed results: Open better, grade 3; traditional better, grades 5 and 8*
5.	Burnham (1971)	"Open plan" vs. "Architecturally conventional" schools	Grade 1 pupils in 2 open plan and 9 conventional schools, York County, Canada	Tests of reading and math achievement	No significant differences

*See *Notes* which appear at the end of Table 1.

Table 1: ACADEMIC ACHIEVEMENT

Study	*Criteria for School Selection*	*Sample*	*Measures*	*Results*
6. Burnham (1973a)	"Open plan" vs. "Architecturally conventional" schools	Grade 2 pupils in 2 open plan and 10 conventionally constructed schools, York County, Canada	Tests of reading, spelling, and mathematics achievement	No significant differences
7. Burnham (1973b)	"Open plan" vs. "Architecturally conventional" schools	Grade 3 pupils in 2 open plan schools (N=155) and 7 conventionally constructed schools (N=409)	Tests of reading and mathematics achievement	No significant differences
8. Butson (1975)	"Alternative elementary school built on the principle of openness" vs. "local conventional elementary schools"	Grade K-6 pupils in 1 open school and 4 conventional schools in rural Minnesota	Wide Range Achievement Test (3 subtests)	No significant differences*
9. Case (1971)	New middle school ("interdisciplinary, non-graded, individualized; flexible") vs. "regular elementary self-contained classrooms"	Grade 5 pupils in 1 middle school (N=131) and 3 elementary schools (N=138) in Montgomery County, Maryland	Stanford Achievement Test (reading and arithmetic)	Open better, particularly in arithmetic

Table 1: ACADEMIC ACHIEVEMENT

	Study	Criteria for School Selection	Sample	Measures	Results
10.	Cline & Ferb (1975)	EDC Open Classroom Model Follow Through vs. local comparison non-Follow Through classrooms	Follow Through and non-Follow Through pupils in grades K-3	Wide Range Achievement Test: Metropolitan Achievement (math and reading)	Open better
11.	Crandall (1973)	"Open concept" vs. "more formal" classes, as determined by Classroom Observation Rating Scale	188 Grade 1 pupils in 6 open and 6 formal classes in 6 Rhode Island communities	Stanford Early School Achievement Test, Level II	Mixed results: No significant differences on 3 subtests; traditional
12.	Daniels (1974)	"Open space" (with team teaching, individualized instruction) vs. "traditional, self-contained" classrooms	Grades 2, 4, and 6; 20 pupils from each grade in each school; 2 open space schools (N=120) and 2 traditional schools (N=120)	Stanford Achievement Test (reading and mathematics)	Mixed results: Open better on "certain subtests at certain grade levels," but "no consistent pattern" of results
13.	District #6, Philadelphia (1973)	EDC Follow Through (open education model) vs. non-Follow Through classrooms in same schools prior to introduction of F.T. program	Grade 3 pupils in Philadelphia schools	Iowa Tests of Basic Skills	Open better*
14.	Egeland, Marsh & Feldman (1972)	Demonstration "open classroom" kindergarten vs. "control group" from "reg-	23 Kindergarten children in demonstration class in school serv-	Stanford Early Achievement Test (SEAT) (Environment,	Mixed results: No significant differences in gains

Table 1: ACADEMIC ACHIEVEMENT

Study	*Criteria for School Selection*	*Sample*	*Measures*	*Results*
	ular kindergarten" classrooms	ing "largely lower class population"; control class from school serving "largely middle class neighborhood" given SEAT; control group of 23 children from 6 inner-city schools given PPVT	Mathematics, Letters and Sounds subtests); Peabody Picture Vocabulary Test (PPVT) (pre-tests given in November, post-tests in May of same school year)	on SEAT; Open better on PPVT (i.e., open made significant gain; traditional made no gain)
15. Elkin et al. (1973)	Children attending the World of Inquiry School (open classroom program) vs. a matched control group of children taken from the World of Inquiry waiting list and attending more traditional schools	24 matched pairs of World of Inquiry and control children, tested once in 1970-71 and again in 1971-72, Rochester, N.Y.	Wide Range Achievement Test (reading, spelling, and arithmetic)	No significant differences
16. Firester (1974)	"Open vs. traditional classroom structure," as determined by "extended structured and unstructured observations"	Grade 2 pupils (27 boys, 27 girls) in each of 2 schools (1 open, 1 traditional) in a small "homogeneous middle class community"	"School district's annual achievement tests"	No significant differences

Table 1: ACADEMIC ACHIEVEMENT

	Study	*Criteria for School Selection*	*Sample*	*Measures*	*Results*
17.	Godde (1972)	"Individual progression curriculum organization" (open) vs. "traditional curriculum organization"	Kindergarten and Grade 1 pupils in 2 schools	Stanford Early School Achievement Test (Environment, Mathematics, Letters and Sounds, and Aural Comprehension subtests) for Kindergarten subjects; Metropolitan Achievement Test (Word Knowledge, Word Discrimination, and Reading subtests) for Grade 1 subjects	No significant differences
18.	Gooch and Kellmer Pringle (1966)	"Formal traditional approach" vs. "informal progressive approach	Secondary school pupils (age 15), 37 of whom had attended a traditional junior school and 44 of whom had attended a progressive ("open") junior school in the English Midlands, four years prior to testing	WISC Vocabulary subtest; Vernon Graded Arithmetic/Maths Test: NFER Secondary Reading Test 2	Traditional better

Table 1: ACADEMIC ACHIEVEMENT

Study	*Criteria for School Selection*	*Sample*	*Measures*	*Results*
19. Grapko (1972)	"Open space" vs. "traditional classroom structure"	Children in 2 Ontario schools matched on SES	Canadian Test of Basic Skills	Mixed results: Grade 6: Traditional better Other grades: not reported (no significant differences?)
20. Greener (1972)	"Open classroom" vs. "traditional" instruction	124 Kindergarten, Grade 1, and Grade 2 pupils in a Twinsburg, Ohio, school, assigned randomly to either open or traditional classrooms	Wide Range Achievement Test (reading, spelling, mathematics) for Kindergarten subjects; Gates-McGinnitie Reading Test and Stanford Achievement Test (mathematic comprehension and concepts subjects) for Grade 1 and 2 subjects	Mixed results: Open better in Kindergarten; No significant differences in Grade 1 or Grade 2*
21. Hill (1973)	"Open concept thermal controlled school" vs. "conventional nonthermal controlled school"	602 pupils in Grades 3, 4, 5, and 6, 280 in "open" school and 322 in conventional" school	Stanford Achievement Test (word and paragraph meaning, language, arithmetic computation, concepts and applications subtests)	Mixed results: Generally no significant differences except: Grade 3: Traditional better on arithmetic compu-

Table 1: ACADEMIC ACHIEVEMENT

Study	Criteria for School selection	Sample	Measures	Results
				tation; Grade 4: Open better or word meaning, arithmetic concepts and applications; Grade 5: Open better on arithmetic computation and applications
22. Hopke (1974)	"Open concept" vs. "traditional self-contained" classroom, as determined by two trained observers using Walberg and Thomas' Observation Rating Scale and teachers' responses to Walberg and Thomas' Teacher Questionnaire	140 pupils in Grades 1, 2, and 3 in 1 open and 1 traditional school	Iowa Tests of Basic Skills	Mixed results: Grade 1: No significant differences; Grades 2 and 3: traditional better "on some of the subtests"
23. Jeffreys (1970)	"Pupil-centered" (open space, ungraded, team teaching, individualized instruction) vs. "conventional" school. Pupil-centeredness determined by systematic observation of pupil and teacher behaviors	Grade 3 and 5 pupils in 1 "open" and 1 traditional school	"Standarized achievement tests"	No significant differences

Table 1: ACADEMIC ACHIEVEMENT

	Study	*Criteria for School Selection*	*Sample*	*Measures*	*Results*
24.	Johnson (1970)	"Open" vs. "traditional" schools	(Not specified)	Iowa Tests of Basic Skills	No significant differences
25.	Kelton (1974)	"Open education team approach" vs. "traditional" approach	Grade 4 and 5 pupils in 1 suburban Detroit school; "open" group had 2 grade 4 and 2 grade 5 classes working with a four-teacher team; control" group had 1 self-contained grade 4 class and 1 self-contained grade 5 class	Comprehensive Test of Basic Skills	No significant differences
26.	Kennedy & Say (1971)	"Open area" vs. "closed area" schools	(Not specified)	SRA Achievement Tests	No significant differences
27.	Killough (1971)	"Open space, non-graded" vs. "traditionally designed" schools	150 pupils (divided equally by sex in year in school) in each of 2 school programs (1 "open" and 1 "traditional")	SRA Achievement Tests (arithmetic reasoning, concepts, and computation; reading comprehension, and vocabulary subtests)	Open better*

Table 1: ACADEMIC ACHIEVEMENT

	Study	*Criteria for School Selection*	*Sample*	*Measures*	*Results*
28.	Lickona (1971)	"Open corridor" program	Children in P.S. 84, one of Lillian Weber's "Open corridor" schools in New York City	Metropolitan Achievement Test and other measures of reading ability	Open better*
29.	Lovell (1963)	"Informal" (pupils allowed to follow own interests; creative work actively encouraged vs. "formal" (more teacher directed, traditional curriculum) schools, as identified by a Local Education Authority in England	1,329 fourth year (i.e., Grade 5) and 1,205 third year (i.e., Grade 4) junior school pupils in 11 formal and 11 informal schools in England, matched for social class	Vernon Graded Word Test (fourth year pupils) N.F.E.R. Sentence Reading Test (third year pupils)	No significant differences
30.	McPartland & Epstein (1975b)	Variations in "'openness' of school's instructional program" and "authority systems of classrooms"	6,185 pupils from 23 elementary schools, 10 middle schools, and 6 high schools of a Maryland suburban district	"Student achievement" (measures unspecified)	No consistent pattern" of differences overall between open and traditional school groups; but correlation between school openness and achievement was higher for higher SES students than for lower SES students

Table 1: ACADEMIC ACHIEVEMENT

Study	Criteria for School Selection	Sample	Measures	Results
31. Moore (1974)	"Open" vs. "traditional" classes	136 Grade 3 pupils (65 open and 71 traditional) and 230 Grade 4 pupils (118 open and 112 traditional) from 5 elementary schools in Romeoville, Illinois	California Achievement Tests	Mixed results: Grade 3: Traditional better on five subtests (reading comprehension, mathematics concepts and problems, language usage and structure, language mechanics, and total language); no significant differences in spelling; Grade 4: No significant differences on 9 subtests (vocabulary, reading comprehension, total mathematics, language mechanics, total language, spelling, and total achievement); traditional better on mathematics computation
32. Morris (1974)	"Open" vs. "traditional" classrooms, as determined by median-split on teachers' responses to Walberg and Thomas' Open Education Teacher Questionnaire	570 pupils in Grades 2, 3, and 4 from 13 open-space and 16 self-contained classrooms in Oklahoma City	Metropolitan Achievement	No significant differences

Table 1: ACADEMIC ACHIEVEMENT

	Study	*Criteria for School Selection*	*Sample*	*Measures*	*Results*
33.	Nash & Christie (1972)	"Open" vs. "traditional" schools	Canadian schools	Canadian Tests of Basic Skills	Open better on tests of vocabulary, work study skills, and mathematics
34.	New Orleans Public Schools (1968)	"Experimental modified curriculum" (activity-oriented, integrated activities") vs. "control classes"	Kindergarten classes in "disadvantaged" areas of New Orleans	Measures of motor-visual skill, fluency, vocabulary, oral communication	Open better
35.	Owen (1974)	"Open vs. traditional"	Middle school pupils, matched for IQ	"Five achievement measures"	No significant differences
36.	Ray et al. (1972)	"Open education program" vs. "traditional program"	Pupils in Grades 1, 2, and 3 in low-income area schools in Hartford, Conn.	California, Stanford and Metropolitan Achievement Tests (reading and mathematics)	Mixed results: Open better in Grade 1 reading and Grades 2 and 3 mathematics; No significant differences in Grade 1 mathematics and Grades 2 and 3 reading
37.	Reel (1973)	"Open" vs. "traditional" classrooms	66 pupils in Grades 5 and 6 in one "open" and two "traditional" classrooms in a college laboratory school	Stanford Achievement Test	No significant differences

Table 1: ACADEMIC ACHIEVEMENT

Study	Criteria for School Selection	Sample	Measures	Results
38. Reiss & Dyhdalo (1974)	"Open space" vs. "self-contained classes"	Grade 2 children (206 in three schools with open space programs and 227 in four schools with self-contained programs) in Oak Park, Illinois	California Achievement Test	Open better
39. Reynolds (1974)	"Open classroom instructional program" vs. "traditional instructional program"	250 pupils in Grades 1-6 in 2 Pennsylvania schools	(Not specified)	No significant differences
40. Richards & Bolton (1971)	"Discovery approach" (open) vs. "traditional methods" vs. "balance between traditional and discovery methods" in mathematics teaching	265 fourth year (i.e., Grade 5) pupils in three junior schools in the Northeast of England	NFER Concept Test, Part A; Series completion test; Gap-Filling Test; Early Problems Test (require "understanding" rather than "rote"); NFER Arithmetic Progress Test C1 (mechanical and problem sections); NFER Intermediate Mathematics Test 1 (concepts)	Mixed results: Traditional and "balanced" better than open on mechanical and problem arithmetic; "balanced" better than "open" on concepts; no differences on Easy Problems

Table 1: ACADEMIC ACHIEVEMENT

Study	Criteria for School Selection	Sample	Measures	Results
41. Robinson (1974)	"Open" vs. "traditional" schools, as determined by "educational beliefs inventory" (teacher rating scale)	Grade 3 pupils in schools matched for race and SES	"The required Arizona third-grade reading test"	Traditional better
42. Sackett (1971)	"Open space" (team teaching, humanistic approach, maximum freedom for exploration") vs. "self-contained" ("recent design with conventional grade levels and self-contained classrooms") vs. "departmentalized" ("traditional in design with conventional grade levels and departmentalized classrooms")	Grade 6 pupils in three neighboring elementary schools	Iowa Tests of Basic Skills	Traditional better (self-contained and departmentalized equal to each other and supeior to open space)
43. Samph & Campbell (1974)	Participating in "Quest Program" (open education) at a college campus laboratory school vs. "graded traditional programs" in public elementary and parochial school	Grade 7 students in a New York State junior high school, 29 of whom had attended "Quest" (Open classroom) in Grade 6 and 170 of whom had attended traditional school programs	Stanford Achievement Test (Paragraph Meaning and Mathematics Concepts sub-tests); also, Grade 7 school marks in English, mathematics, science, and social studies	Generally no significant differences, though open subjects "appeared to have lower marks in mathematics"

Table 1: ACADEMIC ACHIEVEMENT

Study	Criteria for School Selection	Sample	Measures	Results
44. Scheiner (1969)	"Modern English Infant School approach" vs. "traditional approach"	Grade 3 pupils in one inner-city school in Philadelphia (62 pupils in 3 open classrooms and 58 pupils in 3 traditional classrooms)	Iowa Tests of Basic Skills (reading and arithmetic)	No significant differences
45. Scheirer (1972)	"Open" vs. "traditional" schools	All children in one open and five traditional schools (N=1,163)	Stanford Achievement Tests	No significant differences (with IQ and SES controlled by covariance)*
46. Shapiro (1971)	Bank Street Follow Through program (open) vs. neighborhood, non-Follow Through comparison classrooms (traditional); differences between approaches determined by extensive observations and teacher interviews	151 Black, low SES, Grade 1 pupils in one Follow Through classroom and one comparison classroom in each of three locations: Tuskeegee, Alabama; Brooklyn, New York; and Philadelphia, Pennsylvania	Metropolitan Achievement Test; Philadelphia Reading Test; Gates-McGintie	"No outstanding differences"*
47. Spigel (1974)	"Open space" vs. "traditional construction schools	2,000 pupils in Grades 4 and 7 in Ontario, Canada	Unspecified	No significant differences

Table 1: ACADEMIC ACHIEVEMENT

	Study	Criteria for School Selection	Sample	Measures	Results
48.	Stallings (1974)	"More open, more flexible classrooms" vs. "more highly structured classrooms"	20 Grade 1 and 20 Grade 3 classrooms for each of seven Follow Through sponsors, at five or more sites per sponsor. Follow Through models, ranging from open classroom to behavior modification, were compared with each other and with traditional non-Follow Through classrooms	Metropolitan Achievement Test	Mixed results
49.	Stowers (1974)	"Open plan" vs. "architecturally conventional" schools	Grade 6 pupils in four conventional and four open plan schools in a Washington, D.C. suburb	S.R.A. Multilevel Achievement Series (language arts, reading, and math)	Mixed results: Traditional better on math; Other results not reported*
50.	Townsend (1971)	"Open space" vs. "departmentalized" vs. "self-contained" schools	Pupils in Grades 2 and 6 in three representative schools	Stanford Achievement Test	Mixed results: "Better achievement growth in more subject areas by children in a self-contained and departmentalized school than in an open concept school"*

Table 1: ACADEMIC ACHIEVEMENT

	Study	*Criteria for School Selection*	*Sample*	*Measures*	*Results*
51.	Traub, Weiss, & Fisher (1974) (also Traub, Weiss, Fisher & Husella, (1972)	"*Programmatic openness*" ("less open" vs. "more open," as determined by the 29-item Dimensions of Schooling Questionnaire administered to teachers) and "*architectural openness*"-- "open-space" vs. "closed-space" (self-contained classrooms) vs. "mixed-space" (closed-space buildings with open space additions)	8-, 11-, and 13-year old pupils in 18 suburban (higher SES) and 12 inner-city (lower SES) schools in Ontario, Canada	Canadian Test of Basic Skills	Mixed results: No significant differences in suburban schools; but in "inner-city" schools, "less open" did better than "more open"
52.	Travers (1974)	"Open classrooms" vs. "control classrooms"	635 pupils from 28 open classrooms and 519 pupils from 19 control classrooms (Grades 1-5) in three elementary schools in a suburban Northern New Jersey school district	E.T.S. Cooperative Primary Test (Grade 1); California Achievement Test (Grades 2-5)	No significant differences
53.	Trotta (1973)	"Open class" vs. "traditional class" educational program	138 open class and 160 traditional class pupils in Grades 3, 4, and 5	Iowa Tests of Basic Skills	Mixed results: Open better on arithmetic; No significant differences on reading; open boys better on both reading and arithmetic than traditional boys

Table 1: ACADEMIC ACHIEVEMENT

	Study	*Criteria for School Selection*	*Sample*	*Measures*	*Results*
54.	Tuckman, Cochran, & Travers (1973, 1974)	"Project: Open Classroom" (POC) (teachers visited English Infant schools, attended summer workshop, and received in-service consultation and training) vs. "control classrooms"	Pupils in Grades 1-5 in 3 Wayne, New Jersey schools (14 traditional classrooms and 16 "open" classrooms)	California Achievement Test (reading, math, language and total)	Mixed results: "No clear pattern": of 20 comparisons (4 subtests scores in each of five grades), 9 showed no significant differences; 6 showed open better; and 5 showed traditional better
55.	Warner (1970)	"Open area facility" vs. "self-contained classrooms"	Pupils in self-contained classrooms and a newly-added open area facility in a Friendswood, Texas elementary school	SRA Achievement Tests and Iowa Tests of Basic Skills	No significant differences
56.	Weiss (1971)	"Open" vs. "closed" classrooms, as determined by measures of classroom climate (two administered to teachers and one to pupils	1,063 pupils, grades 3 to 6, in 40 classrooms	Teachers' grades	Open better

Table 1: ACADEMIC ACHIEVEMENT

	Study	*Criteria for School Selection*	*Sample*	*Measures*	*Results*
57.	Williams (1970)	"Individualized early childhood program" vs. "more conventional program"	Kindergarten pupils in individualized U.C.L.A. elementary school and conventional Los Angeles city schools	Measures of "self-related skills," reading readiness, and social skills	Open better
58.	Winnett & Edwards (1974)	"Open" vs. "traditional" classrooms	Grade 3 pupils of varied SES backgrounds and heterogeneous abilities in a Lexington, Kentucky public school, 25 from an open and 25 from a traditional classroom	California Test of Basic Abilities (reading, language, math, study-skills, total)	No significant differences

The overall pattern of findings is quite mixed. (See Table 1.) Of 58 studies reviewed, 10 favored open schools, 4 favored traditional schools, 17 showed mixed results, and 27 revealed no significant differences. While these findings certainly do not point to a clear superiority of 'open' or 'informal' methods in the teaching of the 'basic skills,' they do not reveal a clear inferiority either, as might possibly be expected due to the more casual atmosphere and the lesser emphasis on drill. Many writers on open education point out that achievement tests do not adequately measure many important aspects of a child's learning and development in school, but what ever other advantages the open classroom may offer to children, the research generally suggests that it does not hinder their academic attainment.

Notes

Broward County, 1972: A survey of teachers in the open area schools showed that they believed their new educational program had not been fully implemented and that the open schools were overcrowded and understaffed.

Butson, 1975: Enrollment in the alternative 'open' school was voluntary.

District #6, 1973: Achievement gains in schools where EDC Follow Through was introduced exceeded gains made over the same time period in other District 6 and Title I schools.

Gooch and Kellmer Pringle, 1966: The results of this study are confounded by the fact that the progressive and traditional school groups came from significantly different social class backgrounds, and the traditional group's higher achievement test scores may well be attributed to their higher SES. Also, when intelligence and sex are taken into account, it appears that brighter children and boys tended to do better in traditional education while duller children and girls tended to do better in progressive education (p. 35).

Greener, 1972: Though achievement results were mixed, open classroom subjects showed "generally superior" gains in IQ (measured by the *Pinter-Cunningham Primary Test*, given at beginning and end of the school year), compared to traditional classroom subjects.

Lickona, 1971: Lickona cites a 1970 report of the P.T.A. of P.S. 84 claiming the following achievement gains

SELF-CONCEPT

The second most popular area of research on the open classroom has dealt with the question of self-concept. While this is an area of research in child development fraught with serious methodological problems (Gordon, 1969; Wylie, 1961), many investigators have nonetheless endeavored to make use of the various self-concept measures available to test the hypothesis that children in open classrooms feel better about themselves (or at least indicate to adult testers that they feel better about themselves).

The results, once again, are quited mixed. (See Table 2.) Of 32 studies reviewed, seven favored open schools, two favored traditional schools, eight showed mixed results, and 15 revealed no significant differences. To what extent this rather inconclusive pattern of results is indicative of measurement problems and to what extent it may reflect a

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for the school's new open corridor program: (1) 99 percent of the children in the open program were reading by the end of the first grade, an unprecedented event in the school; (2) second graders in the program scored well above the national norm on the *Metropolitan Achievement Test;* (3) four times as many black and Spanish-speaking children in the program were reading at or above grade level than their peers not in the program.

Scheirer, 1972: Data were collected only 4 to 5 months after open classroom methods were initiated. Scheirer says her results should be viewed as "tentative, because of the very limited time elapsed between the introduction of open education and the collection of the data."

Shapiro, 1971: Achievement test findings were inconclusive in this study because of serious methodological problems. The non-Follow Through classroom in Alabama was not tested at all; the Follow Through and non-Follow Through classrooms in Brooklyn were each given different tests; and the two Philadelphia classrooms were given yet a different test.

Stowers, 1974: An assessment of the extent to which teachers in this study saw themselves as using open education practices in their classrooms revealed no significant differences between the open plan and architecturally conventional schools.

Towsend, 1971: An assessment of teaching style in the three types of school, using the *Flanders Interaction Analysis* (observation procedure), found little difference in teaching style.

genuinely uneven impact of open schooling on self-concept is not readily apparent. One problem with the studies of self-concept which have been reviewed is that all of them present self-concept as a unitary, linear entity: i.e., children either have high self-concepts, medium ones, or low ones. While lending itself to easily quantifiable data, this notion of self-concept or self-esteem as a single-factor variable is probably inadequate for dealing with the complex question, "What do these groups of children think of themselves?", which the studies purport to ask.

The only investigation to date which has attempted to assess in a more complex way the effects of school experience on self-concept is the Bank Street study (Minuchin et al., 1969). While the authors of this study did include a measure of "overall self-satisfaction" (the semi-projective *Stick Figure Scale*), their analysis also went much further. No significant differences between 'modern' (open) and 'traditional' schools were found on the general self-satisfaction measure. But the children in the 'modern' schools were found to be significantly

> more differentiated in their self-perceptions, more accepting of negative impulse as part of the self, more invested in their childhood status, and more open in their conceptions of social sex roles...

while the traditionally schooled children were found to be "more consistently impersonal, future-oriented, and conventional in their images of roles and development" (p. 372). The willingness of the Bank Street researchers to employ time-consuming interview methods and projective devices in addition to questionnaires allowed for a broader exploration of children's self-conceptions than was possible in other studies that employed a single-score self-concept questionnaire. The effects of different appraoches to schooling on still other aspects of the child's self-image and self-esteem remain to be assessed in future research.

ATTITUDE TOWARD SCHOOL

A somewhat clearer pattern of findings has emerged in studies investigating attitudes toward school. The observation that open classrooms seem to be more enjoyable for children than traditional classrooms has been made by both proponents and critics of open education. The critics generally claim that the school as an institution has more important tasks to accomplish (e.g., teaching basic skills) than letting children have fun; the proponents contend that enjoyment of school is important in its own right (cf. the famous statement by the *Plowden Report* that "the best preparation for being a happy and useful man or women is to live fully as a child" (Central Advisory Council, 1967, p. 506).

Barth (1970) has proposed a list of open education characteristics which he feels explain why children in open classrooms *should* enjoy school more than children in traditional classrooms, but the question of whether they actually *do* is, of course, an empirical one. Of 30 studies which set out to answer that question (see Table 3), 14 found that open classroom children held more positive attitudes toward school, compared to only two studies favoring traditional classrooms. Seven studies showed mixed results, and seven revealed no significant differences.

While certainly not unanimous, the bulk of this evidence does indicate that, compared to children in traditional classrooms, open classroom children feel at least equally positive, and often more positive, toward their school experience.

CREATIVITY

Another variable which has received a fair amount of attention in the open classroom evaluation research is creative thinking. Writers in the creativity field have long maintained that schools can do more than they have traditionally to foster the development of creative thinking in children (e.g., Biber, 1959; Getzels and Jackson, 1962; Hudson, 1966; Torrance, 1962; Wallach and Kogan, 1965). Many of the descriptions of open classrooms suggest that far more creative activity occurs in them than is normally the case in conventional schools. The hypothesis that children in open classrooms will perform better than traditional classroom children on tests of creative thinking has therefore been of considerable interest to researchers. As with studies of self-concept, however, the creativity research has suffered from inadequacies of definition and measurement. The whole question of what creative thinking is and how one can assess and measure it is fraught with difficulties and continues to be debated in the literature (e.g., Crockenberg, 1972).

Of 19 studies relating creativity and open education (see Table 4), eight of them indicated that children in open classrooms were more creative than children in traditional classrooms, eight showed mixed results, and three found no significant differences. No studies favored the traditional classroom. In her research in England, Gardner (1966) found greater evidence of what she called 'ingenuity' and 'inventiveness' among children in the open school than among those in traditional schools. Her 'test,' which she considered similar to some of Torrance's *Creativity Tests*, required the child to assemble bits of paper and other objects into a picture, which was then rated for its ingenuity by three teacher-judges. Minuchin et al. (1969) utilized four measures of 'imaginativeness'--ratings of stories told in response to TAT-like pictures (the *Children's Picture Story Test*): ratings of play with miniature life toys (people,

animals, vehicles, furniture, etc.) in a 30- to 45-minute session; ratings of titles made up in response to pictures; and ratings of responses to a similes task. Contrary to their prediction that the open school children would show greater imaginativeness than the traditional school children, however, no significant differences were obtained.

Like Minuchin et al. (1969), Elkind, Deblinger and Adler (1970) were surprised when their evaluation research failed to show the expected superiority in creative thinking for pupils in an open classroom program, and in response to their puzzlement, they created an ingenious experiment which raises the intriguing possibility that some of the nonsignificant findings obtained in their own and other workers' research may be misleading. Noting that most creativity tests are 'production' tasks which require the child to give as many responses as he can to a particular stimulus (e.g., "tell me all the different ways in which you can use a newspaper"), they point out that the longer a child is willing to stick with a task, the more responses he will give, and the higher his 'creativity' score will be. Since testing is usually done during school time, any time spent thinking up answers to the creativity test items is time *not* spent in the classroom. If it is true that open classrooms are more enjoyable places for children than traditional classrooms, Elkin et al. reasoned, then any differences in creativity scores between classroom types may be partly attributable to the fact that the traditional classroom children feel less inclined to hurry through the testing in order to return to their classrooms and therefore more motivated to give large numbers of responses to the creativity test questions.

To test this hypothesis, an experiment was designed in which children were given creativity tests under two different conditions: one in which they were temporarily taken away from an ongoing 'interesting' activity, and one in which they were temporarily taken away from an ongoing 'uninteresting' activity. The 'interesting' condition was determined by the child's own interests (as indicated by the teacher) and involved such activities as games, drama, reading, gym, music, etc. The 'uninteresting' condition involved an assignment to circle all the n's and 6's on two sheets of letter and number combinations. The subjects in the study were 32 children ranging in age from five to 12, and the creativity tests included the class concept, similarities, and alternate uses procedures from Wallach and Kogan (1965). All subjects were tested under both the 'interesting' and 'uninteresting' conditions, half receiving the 'interesting' condition first and half the 'uninteresting' condition first. Since each child was tested twice for creativity, two equivalent forms of the Wallach and Kogan tests were utilized, half the subjects receiving one form first, half receiving the other form first.

The results of this experiment were quite striking: children gave a significantly larger number of responses

when taken away from an 'uninteresting' activity than they did when taken away from an 'interesting' activity (a mean of 57.09 compared to a mean of 32.09). Under the 'uninteresting' condition, they also gave significantly more 'unique' responses (i.e., responses given by no one else in the sample--another measure of creativity)--a mean of 9.58 vs. a mean of 3.0.

What the results suggest, as Zigler and Butterfield (1968) demonstrated with IQ tests, is that creativity test performance seems to be greatly affected by the motivational context. There may be reason to believe, then, that the actual creative thinking ability of open classroom children might be somewhat greater than is suggested by the test results reported in the literature.

INDEPENDENCE AND CONFORMITY

An area related to creativity that has been examined in a number of evaluation studies is independence. Yeomans (1967) has described the informal/open classroom approach to teaching as "education for initiative and responsibility," and there is a strong emphasis in the open education literature (e.g., Barth, 1972; Rathbone, 1971; Weber, 1971) on viewing the child as an 'active agent' in his own learning and the classroom as a place to provide maximal opportunities for fostering self-reliance and autonomy.

Researchers investigating independence in open classroom children have investigated the phenomenon in several different ways. Some have used classroom observation and teacher ratings of children's behavior; some have used pencil and paper tests; others have devised experimental tasks. Nineteen studies have been reviewed, and although the findings are not entirely consistent, they tend generally to support the hypothesis that open classrooms do promote greater independence. (See Table 5.) Only one study reported higher independence for a traditional classroom sample; two found no significant differences, and two obtained mixed results. The remaining 14 studies all favored the open classroom.

CURIOSITY

Since one of the major aims of the open classroom is to stimulate children's curiosity and encourage them to develop and explore their own interests, several investigators have attempted to measure whether open classroom children are in fact more curious than their counterparts in traditional classrooms.

The measurement of curiosity in children has posed some serious methodological problems, however. Some researchers, for example, have utilized a classroom observation procedure (e.g., counting the number of questions asked

by pupils in the different classroom types). While question-asking behavior seems a reasonable index of curiosity, it is somewhat unsatisfying as an evaluation tool for at least three reasons: (1) asking a question is only one, outwardly expressed, form of curiosity; many other expressions of curiosity--e.g., 'wondering' about things, observing natural phenomena, looking information up in books--occur in classrooms, not necessarily in direct proportion to the amount of audible question-asking; (2) the amount of question-asking in a particular classroom may be more indicative of the teacher's expectations and rules than of the children's curiosity--i.e., children may ask fewer questions in a more tightly controlled classroom because they are not allowed to, but be just as curious in their attitude and behavior outside the classroom as children who are allowed to ask questions in school; and (3) question-asking--particularly of teachers--is sometimes more a reflection of dependency than curiosity: knowing *what kind* of questions are asked would seem to be at least as important as *how many* questions were asked, though none of the studies of question-asking which were reviewed in fact used a quality measure in conjunction with a quantity measure.

But problems also exist in other procedures used to measure curiosity. Questionnaires and other self-report forms have questionable validity, and the experimental procedures which involve sitting a child down and giving him a task on which he can choose to behave curiously or not curiously seem to miss the whole point of curiosity as self-directed, self-initiated exploratory behavior; when the task demand of the experiment is "be curious for me," one has to wonder if the resulting behavior is really curiosity or some form of adult-pleasing.

For all the methodological difficulties, however, curiosity remains an important dimension worthy of evaluation. Eleven studies assessing curiosity in open vs. traditional classrooms were reviewed (see Table 6). Four of them favored the open classroom children, two showed no consistent or significant differences, and five obtained mixed results. No study found evidence of greater curiosity among traditional classroom children. In addition to the measurement problems already discussed, Kreitler, Kreitler and Zigler (1975) and Wilson, Langevin and Stuckey (1972) have noted that curiosity is a multi-faceted phenomenon for which single-scale measurement is probably inadequate. More work at instrument development and further evaluation studies would therefore seem to be necessary before a satisfactory answer can be given to the question of whether open classrooms do in fact promote greater curiosity than traditional classrooms.

ADJUSTMENT AND ANXIETY

Several investigators have sought to examine whether chil-

dren in open classrooms appear to have greater personal adjustment and less anxiety than children in traditional classrooms. Again, the results have been quite inconclusive (see Table 7). Of seven studies dealing specifically with anxiety, two found the open classroom children to be less anxious, two found no significant differences, and one obtained mixed results. Of 10 studies dealing more generally with personal adjustment, two found evidence of greater adjustment in the open classrooms, three found no significant differences, and five showed mixed results; no studies favored the traditional classroom. This very mixed pattern of findings is difficult to interpret and points to a need for further study of children's emotional reaction to the open classroom experience.

LOCUS OF CONTROL

'Locus of control' is a psychological variable referring to the extent to which a person feels he has control over his own destiny. As explained by Knowles (1972),

> the feeling of control can be conceived to be spread out along a continuum. At one end, *internal control* connotes the attitude that one can manipulate environments for reinforcements. One that is internally controlled sees himself as intrumental in the outcome of events. On the other end of the continuum, *external control*, the self-attitude is characterized by the feeling that all that happens to the individual is the consequence of chance, luck, fate, etc., all of which are forces and events beyond the subject's control (p. 94).

The notion of the open classroom as an environment which provides many opportunities for choice and encourages the development of responsibility for one's own actions (e.g., Yeomans, 1967) has led several investigators to test the hypothesis that open classroom children will show more *internal* control than traditional classroom children. The evaluation instruments usually employed were paper and pencil, forced-choice questionnaires with items such as: "Suppose you did better than usual in a subject at school. Would it probably happen (a) because you tried harder, or (b) because someone helped you?" (Crandall, Katkovsky, and Crandall, 1965). In most of the instruments, measures are made of the child's sense of internal responsibility for both his successes and his failures.

Eleven studies were reviewed, and once again, the results were inconclusive. (See Table 8.) Three studies yielded results showing greater internal control among open classroom children, one favored a traditional classroom group, four found no significant differences, and three had mixed results. This is still a relatively small number of

studies, and further research on locus of control and open education is needed. Internal control has been shown to be highly correlated with achievement (Coleman, 1966) and a wide range of cognitive and social skills (Crandall, 1975). The influence of schooling on the development of internal control should continue to be of considerable interest to educators and psychologists.

COOPERATION

Because of the informal atmosphere and emphasis on cooperative learning projects in the open classroom, a number of investigators have designed experimental procedures to determine whether children from those classrooms will show a greater tendency than traditional classroom children to cooperate in group problem solving situations outside the classroom setting. Minuchin et al. (1969), as reported earlier, did find greater evidence of cooperative behavior among the children from the more open school in their sample, although the authors themselves admit that the superior group functioning of the progressive school children may have been due in part to the smaller size of their class (p. 205). Minuchin et al. used the *Russell Sage Social Relations Test*, in which the classroom group is presented with the task of building a house (and then a bridge) out of plastic blocks to match a demonstration model. Each child is given one or two blocks, and the group's behavior in planning and carrying out the construction project is rated by observers. As indicated in Table 9, one other study (Traub et al., 1972) that utilized this test failed to find significant differences between traditional and open classroom groups. Two other experimental studies of cooperation (Duckworth, 1971; Feeney et al., 1974), using similar kinds of tasks, did find the open classroom children more cooperative, however, while a third (Rothschild, 1975) found no significant differences.

Gardner's (1966) research in England made use of another experimental cooperation task similar in some ways to the Russell Sage test and obtained rather mixed results. Groups of junior school children were given a paper pinwheel vane, chalk, and an eraser, and were instructed to make up a "blowing team game." Observers then rated the amount of cooperation in evidence as children devised and played the game. Out of 11 pairs of schools tested, five open schools were rated higher in cooperation, compared to only one traditional school. In the remaining five pairs of schools, however, there were no significant differences between open and traditional groups. In another test situation, designed primarily to measure persistence, children were allowed to choose an activity on which to concentrate, and Gardner's co-workers reported that "many more children" in open than traditional schools "chose to play or work together or share material." (p. 181)

Table 2: SELF-CONCEPT

	Study	Criteria for School Selection	Sample	Measures	Results
1.	Beckley (1972)	"Open concept environment" vs. "self-contained classrooms"	405 pupils in Grades 1-6 in self-contained classrooms, 210 of whom were later transferred to a new "open concept design" school	Sears' Self-Concept Inventory	Open better
2.	Black (1974)	"Open area" vs. "traditional learning environment"	360 Grade 4 children in 6 open area and 6 traditional schools	Piers-Harris Children's Self-Concept Scale and the North York Pupil Self-Concept Scale	No significant differences
3.	Brown (1973)	"Open" vs. "stratified" ("traditional") classrooms	69 open classroom and 65 stratified classroom pupils in Grades 4, 5, and 6 in Manhattan and White Plains, N.Y.	Coopersmith's Self-Esteem Inventory	Mixed results: No significant difference overall, but open better in Grade 4
4.	Daniels (1974)	"Open space" ("based upon team teaching, individualized instruction, and variable sized groups of students") vs. "traditional" ("self-contained classroom organization") schools	120 pupils from two open space schools and 120 pupils from two traditional schools, 20 pupils from each of three grades (Grades 2, 4, and 6) from each school	Measures of self-esteem and sense of competence (satisfaction with own ability and evaluation of this ability in comparison to others)	No significant differences

Table 2: SELF-CONCEPT

Study	Criteria for School Selection	Sample	Measures	Results
5. Feeney, Hochschild, Joy & Sadow (1974)	"Open" vs. "high transitional" vs. "low transitional" classrooms, as determined by classroom observation and teacher interview assessment of materials available to children, number of activity centers, student groupings, variety and scheduling of activities, and degree of student choice	11 open, 11 "high traditional" and 11 "low transitional" (traditional) classrooms in Buffalo, N.Y.	The "How I See Myself" self-concept inventory	Open better (Grades 2 and 6)
6. Elkin et al. (1973)	Children attending the World of Inquiry School (open classroom program) vs. a matched control group of children taken from the World of Inquiry waiting list and attending more traditional schools	24 matched pairs of World of Inquiry and control children, tested once in 1969-70 and again in 1971-72, Rochester, N.Y.	Adjective check-list	No significant differences
7. Franks, Marolla & Dillon (1974)	"Open" vs. "traditional" classrooms, as determined by Dillon, Grout and Franks observation check-list, Traub-Weiss teacher self-report on openness (DISC), and McPartland's students' perception of openness	472 Grade 7-8 pupils from five open schools (N=302) and two traditional schools (N=170) in a large midwestern city; two of the open schools draw from low income black areas, two from middle income	7-item Likert-type "inner self-esteem" scale ("autonomously gained feelings of potency"); 10-item Likert-type "outer self-esteem" scale ("self-assessments in regard to how	Mixed results: Open better on "inner" self-esteem; no significant differences on "outer" self-esteem

Table 2: SELF-CONCEPT

	Study	Criteria for School Selection	Sample	Measures	Results
			black, one from an upper-middle class, 73% white area; the two traditional schools draw from a middle class, 70% white population	others view the subject")	
8.	Glinsky (1973)	"Open classes" vs. "more restricted environments"	Fourth grade pupils in nine classrooms	(Not specified)	No significant differences
9.	Heimgartner (1972)	"Open space" vs. "self-contained classrooms"	216 pupils, Grades K-5, in an open space university laboratory school and a traditional school in Greeley, Colorado	Self-Social Symbols Tasks; Children's Self-Social Constructs Test	Open better
10.	Hopke (1974)	"Open concept" vs. "traditional self-contained" classrooms, as determined by the Walberg & Thomas classroom observation rating scale and teacher questionnaire	140 pupils in Grades 1, 2, and 3 in one open and one traditional school	Self-Concept and Motivation Inventory (measured academic self-concept and academic motivation); Self-Appraisal Inventory (measured global self-concept)	Mixed results: No significant differences in academic self-concept; open better in global self-concept
11.	Judd (1974)	"Open space" vs. "traditional" schools	315 Grade 6 pupils, 141 in 3 open-space schools and 174 in 3 traditional schools	Questionnaire measuring "self-concept as a learner"	No significant differences overall, but significant interaction with

Table 2: SELF-CONCEPT

Study	Criteria for School Selection	Sample	Measures	Results
				locus of control: in open schools, high internal S's had more positive self-concept; in traditional schools, high external S's had more positive self-concept
12. Kelton (1974)	"Open education team approach" vs. "traditional" approach	Grade 4 and 5 pupils in one suburban Detroit school; "open" group had two Grade 4 and two Grade 5 classes working with a four-teacher team; "control" group had one self-contained Grade 4 class and one self-contained Grade 5 class	Piers-Harris Children's Self-Concept Scale	No significant differences
3. Kohler (1973)	"Open" vs. "traditional" schools, as determined by the Walberg & Thomas Scales	316 pupils, age 9 to 12, from six suburban schools	Sears' Self-Concept Inventory	Mixed results: No significant differences overall, but open males better than traditional males

Table 2: SELF-CONCEPT

	Study	Criteria for School Selection	Sample	Measures	Results
14.	Koskoff (1973)	"Open" vs. "traditional" classrooms," as determined by the Walberg & Thomas Classroom Observation Rating Scale	223 pupils in Grades 3 and 4, 115 from an "open situation" and 108 from a "traditional setting"; schools matched for SES, teacher-pupil ratio and geographical area	Piers-Harris Children's Self-Concept Scale	Mixed results: No significant differences overall, but poor-reader boys in open schools had better self-concept than poor-reader boys in traditional schools
15.	Krenkel (1973)	"Open" vs. "standard" classrooms	Black, Asian, and White pupils in Grades 4-6	"How Children Feel About Me"	Open better
16.	Moore (1974)	"Open" vs. "traditional" classes	136 Grade 3 pupils (65 open and 71 traditional) and 230 Grade 4 pupils (118 open and 112 traditional) from 5 elementary schools in Romeoville, Illinois	Coopersmith Self-Esteem Inventory	No significant differences
	O'Neill (1974)	"Open space" vs. "conventional" schools, as determined by both architecture and observers' ratings of classroom flexibility and teacher directiveness	96 Grade 4 girls in 3 open space and 3 conventional schools in a white, middle-class suburban Illinois community. On the basis of prior	Coopersmith Self-Esteem Inventory (modified)	Mixed results: For more creative Ss, open better; for high achieving Ss, no significant differences for high creative-

Table 2: SELF-CONCEPT

	Study	Criteria for School Selection	Sample	Measures	Results
			testing of 139 Ss 16 Ss were selected from each school, 4 Ss in each cell of a design with high and low convergent ability (California Achievement Tests) and high and low divergent ability (Wallach & Kogan creativity tasks)		low achieving Ss, open better; for low creative-low achieving Ss, traditional better
18.	Owen (1974)	"Open" vs. "traditional"	Middle school pupils, matched for IQ	Self-concept measure (unspecified)	No significant differences
19.	Purkey (1970)	"Experimental school" ("innovative, team teaching, ungraded, high student choice and self-direction") vs. "control school"	(diff. grade levels)	Self-esteem measure (unspecified)	Open better, increasingly so as grade level increases
20.	Reynolds (1974)	"Open classroom instructional program" vs. "traditional instructional program"	250 pupils in Grades 1 to 6 in two Pennsylvania schools	Self-concept measure (unspecified)	No significant differences

Table 2: SELF-CONCEPT

	Study	Criteria for School Selection	Sample	Measures	Results
21.	Robinson (1974)	"Open" vs. "traditional" schools, as determined by "educational beliefs inventory" (teacher rating scale)	Grade 3 pupils in schools matched for race and SES	"Self-Concept Test"	No significant differences overall, but interaction with readability: self-concept was positively correlated with reading ability in traditional school, but negatively correlated with reading ability in open school
22.	Rudawski (1974)	"Open space" vs. "self-contaned classroom"	250 pupils in Grades 1-5 "who experienced a variety of combinations of open-space and self-contained classroom situations in a school where open space has been utilized at least 6 years"	Piers-Harris Children's Self-Concept Scale	No significant differences
23.	Ruedi & West (1973)	"Open environment" classroom (individualized, demands responsibility of the pupil for his own progress, grants freedom of action, responds to indi-	48 pupils in Grades 4, 5, and 6 (9 Grade 4, 9 Grade 5, and 5 Grade 6 pupils from each of two schools), matched in academic achievement (Stanford	Gordon "How I See Myself" scale (four sub-scales: Interpersonal Adequacy, Autonomy, Academic Adequacy, and Teacher-School, plus	Mixed results: Generally no significant differences; Traditional better on Autonomy sub-scale, Grades 4 and 5, and on

Table 2: SELF-CONCEPT

Study	Criteria for School Selection	Sample	Measures	Results
	individual needs") vs. "traditional environment" classroom ("structured with clear expectations communicated to the pupils by the teacher, who has specific goals for the year's work")	Achievement Word Meaning scores)	Total Self Concept)	Academic Adequacy sub-scale, Grade 6; Open better on Teacher-School sub-scale, all grades combined
24. Sackett (1971)	"Open space" ("team teaching, humanistic approach, maximum freedom for exploration") vs. "self-contained" ("recent design with conventional grade levels and self-contained classrooms") vs. "departmentalized" ("traditional in design with conventional grade levels and departmentalized classrooms")	Grade 6 pupils in three neighboring elementary schools	Coopersmith Self-Esteem Inventory	Traditional better (both self-contained and departmentalized better than open space)
25. Scheiner (1969)	"Modern English Infant School approach" vs. "traditional approach"	Grade 3 pupils in one inner-city school in Philadelphia (75 pupils in 3 open classrooms and 111 pupils in 3 traditional classrooms)	"The Way I Feel About Myself" (questionnaire constructed by the Office of Research and Evaluation of the School District of Philadelphia)	No significant differences

Table 2: SELF-CONCEPT

	Study	Criteria for School Selection	Sample	Measures	Results
26.	Scheirer (1972)	"Open" vs. "traditional" schools	All children in one open and five traditional schools (N=1,163)	Children's Self-Concept Indicator	Traditional better*
27.	Shapiro (1971)	Bank Street Follow Through program (open) vs. neighborhood non-Follow Through comparison classrooms (traditional); differences between approaches determined by extensive classroom observations and teacher interviews	151 black, low SES Grade 1 pupils in one Follow Through classroom and one comparison classroom in each of three locations: Tuskeegee, Alabama; Brooklyn, New York; and Philadelphia, Pennsylvania	General Questions (interview); Sentence Completion; Stick Figure Scale (self-rating); and Draw-a-Person	"No clear significant differences"
28.	Stowers (1974)	"Open plan" vs. "architecturally conventional" schools	Grade 6 pupils in 4 conventional and 4 open plan schools in a Washington, D.C. suburb	Lipsitt self-concept scale	"No consistent differences"*
29.	Traub, Weiss, & Fisher (1974) (also Traub, Weiss, Fisher & Musella (1972)	*"Programmatic openness"* ("less open" vs. "more open," as determined by the 29-item Dimensions of Schooling Questionnaire administered to teachers) and *"architectural openness"*--"open-space" vs. "closed space"	8- and 11-year-old pupils in 6 suburban schools in Ontario, Canada	Self-report inventory of attitudes toward school, teacher, and self	Open space better

Table 2: SELF-CONCEPT

Study	Criteria for School Selection	Sample	Measures	Results
	(self-contained classrooms) vs. "mixed space" (closed space buildings with open space additions)			
30. Travers (1974)	"Open classroom" vs. "control classrooms:	635 pupils from 28 open classrooms and 519 pupils from 19 control classrooms (Grades 1-5) in three elementary schools in a suburban northern New Jersey school district	Self Appraisal Inventory, published by Instructional Objectives Exchange	No significant differences
31. Tuckman, Cochran, & Travers (1973, 1974)	"Project: Open Classroom" (POC) (teachers visited English infant schools, attended summer workshop, and received in-service consultation and training) vs. "control classrooms"	Pupils in Grades 1-5 in three Wayne, New Jersey schools (14 traditional classrooms and 16 "open" classrooms)	Self Appraisal Inventory, published by Instructional Objectives Exchange	Mixed results: Open better, Grades 1-3; No significant differences, Grades 4-5
32. Wilson, Langevin, & Stuckey (1972)	"Open plan philosophy vs. "traditional classroom approach	11- and 12-year-old pupils from four schools in middle-class suburban Toronto (104 pupils from two open schools and 59 pupils from two traditional schools)	Semantic differential questionnaire	Open better

Table 3: ATTITUDE TOWARD SCHOOL

Study	Criteria for School Selection	Sample	Measures	Results
1. Arlin & Palm (1974)	"Open" vs. "traditional" classrooms	1,000 open and 1,000 traditional classroom pupils in Grades 1-8	Four attitude instruments	Mixed results: No significant differences in attitude toward teachers; Traditional showed more positive attitudes toward math and language arts
2. Barker-Lunn (1970)	"Streamed" (ability grouping; "knowledge-centered" teaching) vs. "Non-streamed" (mixed ability grouping; "child-centered" teaching)	2,008 children in 14 streamed and 14 non-streamed junior schools in England (age 9+ to 11+)	Barker-Lunn Children's Attitude Scales	Mixed results: Generally, no significant differences, but on the "Attitude to Class" sub-scale, non-streamed (i.e., open) boys of below-average ability and girls of average ability scored higher; on the "Other Image of Class" subscale, above-average ability pupils scored highest in streamed ("traditional") classes, while there was no difference between ability levels in open classes

Table 3: ATTITUDE TOWARD SCHOOL

Study	Criteria for School Selection	Sample	Measures	Results
3. Crandall (1973)	"Open concept" vs. "more formal" classes, as determined by Classroom Observation Rating Scale	188 Grade 1 pupils in 6 open and 6 formal classes in 6 Rhode Island Communities	Reading Attitude Inventory	Mixed results: No significant differences overall, though Open girls showed significantly greater gains between pre- and post-testing
4. Daniels (1974)	"Open space" (with team teaching, individualized instruction) vs. "traditional, self-contained" classrooms	Grades 2, 4, and 6; 20 pupils from each grade in each school; 2 open space schools (N=120) and 2 traditional schools (N=120)	"How I See Myself"	Open better (Grades 2 and 6)
5. Day (1974)	"Open plan" vs. "traditional" schools	198 pupils in Grades 2-4 in 2 open and 2 traditional schools matched for location and SES in Ontario, Canada; Ss tested once each year for 3 years	(Not specified)	Open better (increasingly so each year)
6. Elkind et al. (1973)	Children attending the World of Inquiry School (open classroom program) vs. a matched control group of children taken from the World of Inquiry waiting list and attending more traditional schools	24 matched pairs of World of Inquiry and control children, tested in 1971-72 in Rochester, N.Y.	32-item attitude scale, with 11 school-related questions	No significant differences

Table 3: ATTITUDE TOWARD SCHOOL

Study	Criteria for School Selection	Sample	Measures	Results
7. Epstein (1974)	"Open environment" vs. "traditional" schools, as determined by student responses to survey questionnaires	3,998 pupils in Grades 6, 8, and 11 in 13 schools	Survey questionnaires assessing general satisfaction with school, interest in classwork, and reactions to teachers	Mixed results: General satisfaction with school: open better in Grade 8; Interest in classwork: open better in Grades 6 and 8; Reactions to teachers: open better in Grades 8 and 11
8. Feeney, Hochschild, Joy, & Sadow (1974)	"Open" vs. "high transitional" vs. "low transitional" (traditional) classrooms, as determined by classroom observation and teacher interview assessment of materials available to children, number of activity centers, student groupings, variety and scheduling of activities, and degree of student choice	11 open, 17 "high transitional," and 11 "low transitional" (traditional) classrooms in Buffalo, N.Y.	Group-administered pupil questionnaire dealing with feelings about teacher and class activities, perception and liking of school	Open better (had more positive feelings about teacher and class activities, saw school as offering them more choice, and said they liked school more)
9. Glinsky (1973)	"Open classes" vs. "more restricted environments"	Grade 4 pupils in 9 classes	(Not specified)	Open better

Table 3: ATTITUDE TOWARD SCHOOL

Study	Criteria for School Selection	Sample	Measures	Results
10. Godde (1972)	"individual progression curriculum organization" (open) vs. "traditional curriculum organization"	Kindergarten and Grade 1 pupils in 2 schools	Scriven Attitude Survey	Open better
11. Hopke (1974)	"Open concept" vs. "traditional self-contained" classroom, as determined by 2 trained observers using Walberg & Thomas' Observation Rating Scale and teachers' responses to Walberg & Thomas' Teacher Questionnaire	140 pupils in Grades 1, 2, and 3 in one open and one traditional school	School Sentiment Index	Mixed results: Open better on two of five subtests
12. Jeffreys (1970)	"Pupil-centered" (open space, ungraded, team teaching, individualized instruction) vs. "conventional" school; pupil-centeredness determined by systematic observation of pupil and teacher behaviors	Grade 3 and 5 pupils in one "open" and one "conventional" school	(Not specified)	No significant differences
13. Judd (1974)	"Open space" vs. "traditional" schools	315 Grade 6 pupils, 141 in 3 open-space schools and 174 in 3 traditional schools	Questionnaire	No significant differences overall, but significant interaction with locus of control; in open schools, high internal Ss had more

Table 3: ATTITUDE TOWARD SCHOOL

Study	Criteria for School Selection	Sample	Measures	Results
				positive attitude toward school; in traditional schools, high external Ss had more positive attitude
14. Kingsmore (1972)	Team-teaching vs. self-contained schools reflecting open vs. closed organizational climate, as measured by the Halpin & Croft Organizational Climate Description Questionnaire	Grade 5 pupils in 4 schools	Baker-Lunn's Student Attitude Scale Questionnaire	Open better than closed; within open, team teaching better than self-contained
15. Reynolds (1974)	"Open classroom instructional program" vs. "traditional instructional program"	250 pupils in grades 1-6 in 2 Pennsylvania schools	(Not specified)	No significant differences
16. Robinson (1974)	"Open" vs. "traditional" schools, as determined by "educational beliefs inventory" (teaching rating scale)	Grade 3 pupils in schools matched for race and SES	"An inventory of reading attitude"	No significant differences

Table 3: ATTITUDE TOWARD SCHOOL

Study	Criteria for School Selection	Sample	Measures	Results
17. Rothschild (1975)	"Open" vs. "individualized" vs. "traditional" classrooms, as determined by 2 observers' ratings on a Classroom Observation Instrument (derived from Walberg & Thomas' rating scale) and a classroom interaction mapping procedure	120 Grade 2 and 120 Grade 3 pupils in 12 classrooms in 5 schools in white, upper middle class, suburban Connecticut communities	Klein & Strickland's Attitude Toward School Questionnaire	Open better than traditional; within open Grade 3 group, children with 3 years open education scored higher than children with just one year
18. Ruedi & West (1973)	"Open environment" classroom ("individualized, demands responsibility of the pupil for his own progress, grants freedom of action, responds to individual needs") vs. "traditional environment" classroom ("structured, with clear expectations communicated to the pupils by the teacher, who has specific goals for the year's work")	48 pupils in Grades 4, 5, and 6 (9 Grade 4, 9 Grade 5, and 5 Grade 6 pupils from each of 2 schools), matched in academic achievement (Stanford Achievement Word Meaning Scores)	The Teacher-School factor in Gordon's "How I See Myself" scale	Open better
19. Samph & Campbell (1974)	Participation in "Quest Program" (open education) at a college campus laboratory school vs. "graded traditional programs" in public elementary & parochial schools	Grade 7 students in a New York State junior high school, 29 of whom had attended "Quest" (open classroom) in Grade 6, and 170 of whom had attended traditional school programs	Semantic Differential Questionnaire dealing with self, classmates, teachers, classes, and school	No significant differences

Table 3: ATTITUDE TOWARD SCHOOL

Study	Criteria for School Selection	Sample	Measures	Results
20. Scheiner (1969)	"Modern English Infant School approach" vs. "traditional approach"	Grade 3 pupils in one inner-city school in Philadelphia (54 pupils in 3 open classrooms and 55 pupils in 3 traditional classrooms)	The Pupil Attitude Toward School Inventory (questionnaire constructed by the Office of Research and Evaluation of the School District of Philadelphia)	No significant differences
21. Scheirer (1972)	"Open" vs. "traditional" schools	All children in one open and five traditional schools (N=1,163)	Children's Attitudinal Range Indicator	Traditional better*
22. Shapiro (1972)	"Creative" (open) vs. "traditional" schools, as determined by teacher responses to Organizational Climate Index and an Inventory of Beliefs, pupil responses to a Classroom Creativity Observation Schedule and an Organizational Climate in the Classroom Test, and "the judgment of experts"	Pupils in four "creative" (open) and four traditional elementary schools	Student Opinion Poll II	Open better
23. Spigel (1974)	"Open space" vs. "traditional construction schools	2,000 pupils in Grades Grades 2 and 7 in Ontario, Canada	Measure of "attitudes about non-physical and physical aspects of their learning environment"	Traditional better

Table 3: ATTITUDE TOWARD SCHOOL

Study	*Criteria for School Selection*	*Sample*	*Measures*	*Results*
24. Stowers (1974)	"Open plan" vs. "architecturally conventional" schools	Grade 6 pupils in 4 conventional and 4 open plan schools in a Washington, D.C. suburb	Attitude Toward School Inventory (developed by Instructional Objectives Exchange)	Mixed results: Boys--traditional better (more positive attitudes toward teachers and peers); Girls--open better (more positive attitudes toward learning and school social structure)
25. Townsend (1971)	"Open space" vs. "departmentalized" vs. "self-contained" schools	Pupils in Grades 2 and 6 in three representative schools	Questionnaire concerning attitudes toward their teachers	Mixed results: Grade 2--traditional better Grade 6--open better
26. Traub, Weiss, & Fisher (1974) (also Traub, Weiss, Fisher, & Musella, 1972)	*"Programmatic openness"* ("less open" vs. "more open", as determined by the 29-item Dimensions of Schooling Questionnaire administered to teachers) and *"architectural openness"*--"open space" vs. "closed-space" (self-contained classrooms) vs. "mixed space" (closed space buildings with open space additions)	8- and 11-year-old pupils in 6 suburban schools in Ontario, Canada	Self-report inventory of attitudes toward school, teacher, and self	Open space better

Table 3: ATTITUDE TOWARD SCHOOL

	Study	Criteria for School Selection	Sample	Measures	Results
27.	Travers (1974)	"Open classrooms" vs. "control classrooms"	635 pupils from 28 open classrooms and 519 pupils from 19 control classrooms (Grades 1-5) in three elementary schools in a suburban northern New Jersey school district	School Sentiment Index, published by Instructional Objectives Exchange	Open better
28.	Tuckman, Cochran, & Travers (1973, 1974)	"Project: Open Classroom" (POC) teachers visited English Infant schools, attended summer workshop, and received in-service training and consultation) vs. "control classrooms"	Pupils in Grades 1-5 in three Wayne, N.J. schools (14 traditional classrooms and 16 "open" classrooms)	School Sentiment Index, published by Instructional Objectives Exchange	Open better
29.	Weiss (1971)	"Open" vs. "closed" classrooms, as determined by measures of classroom climate (two administered to teachers and one to pupils)	1,063 pupils, grades 3 to 6, in 40 classrooms	"An instrument which asked a variety of questions about each pupil's learning experiences	Open better
30.	Wilson, Langevin, & Stuckey (1972)	"Open plan philosophy" vs. "traditional classroom approach"	11- and 12- year-old pupils from four schools in middle class suburban Toronto (104 pupils from 2 open schools and 59 pupils from 2 traditional schools)	Semantic differential questionnaire	

Table 4: CREATIVITY

Study	*Criteria for School Selection*	*Sample*	*Measures*	*Results*
Barker-Lunn (1970)	"Streamed" (ability grouping; "knowledge-centered" teaching); vs. "non-streamed" (mixed ability grouping; "child-centered" teaching)	1,800 third and fourth year junior school children (age 9+ to 11+) in streamed and nonstreamed schools in England	Free Writing Test--essays derived from Imaginative Stories Tasks of Torrance's Minnesota Tests of Creative Thinking and scored for imaginativeness and originality by a panel of three experienced teachers; also, Divergent Thinking tasks (e.g., consequences, unusual uses, toy improvement) derived from Torrance and Guilford and scored for fluency, flexibility and originality according to the Torrance method	Open bett[illegible]
Carini (1972a, 1972b)	Children attending the Prospect School (open classroom program) vs. "a control population of children of similar background, age and IQ "attending traditional schools	Prospect school children plus local control group, Bennington, Vermont	Measures of originality and productivity on a variety of tasks including: alternate uses; solutions to unusual problems; telling stories; forming categories, etc.	Open better

Table 4: CREATIVITY

Study	*Criteria for School Selection*	*Sample*	*Measures*	*Results*
3. Day (1974)	"Open plan" vs. "traditional" schools	198 pupils in Grades 2-4 in two open and two traditional schools matched for location and SES in Ontario, Canada	Creativity tests (unspecified)	"No consistent differences"
4. Duckworth (1971)	Open classrooms participating in Education Development Center's African Primary Science Program vs. more traditional comparison classes	12 children, aged 8 to 13, from each of 15 experimental (open) classes and 13 comparison classes from rural and village schools in Kenya	Ratings of diversity and complexity of constructions made by children with a variety of building and play materials	Open better
5. Elkind et al. (1973)	Children attending the World of Inquiry School (open classroom program) vs. a matched control group of children taken from the World of Inquiry waiting list and attending more traditional schools	24 matched pairs of World of Inquiry and control children, tested once in 1969-70 and again in 1971-72, Rochester, N.Y.	"A three-scale measure requiring children to produce novel responses to unfamiliar items": "alternate uses for familiar objects, flexibility in regard to conceptual properties and similarities among unlike things"	Mixed results: No significant differences the first year; open better in retesting two years later; open showed "faster creativity growth rate"
6. Greener (1972)	"Open classroom" vs. "traditional" instruction	124 Kindergarten, Grade 1, and Grade 2 pupils in a Twinsburg, Ohio school, assigned randomly to either open or traditional classrooms	Torrance Test of Creative Thinking, Booklet A: measures of fluency, flexibility, originality, and elaboration	No significant differences

Table 4: CREATIVITY

Study	Criteria for School Selection	Sample	Measures	Results
7. Haddon & Lytton (1968)	"Informal" (open, progressive) vs. "formal" (traditional) schools, selected after consultation with lectures from a college of education who were familiar with the area, and after advice from a local inspector of schools"	211 children, aged 11 to 12, "of all ability levels," 104 from two formal schools and 107 from two informal schools in England; one formal school and one informal school were in a "predominantly middle class urban area"; the other two schools drew their pupils "from a more mixed social background in a different urban area"; mean IQ for formal schools was 101.75 and for informal schools was 101.14	Three non-verbal ("iconographic") and three verbal tests adapted from the Torrance Creative Thinking Tests, scored for flexibility, originiality, and elaboration	Open better
8. Haddon & Lytton (1971)	Same as Haddon & Lytton (1968)	151 of the original sample of 211 children in Haddon & Lytton (1968), re-tested four years later, at age 15	Same divergent thinking tests as used in Haddon & Lytton (1968), plus teacher ratings of pupil creativity	Open better

Table 4: CREATIVITY

Study	Criteria for School Selection	Sample	Measures	Results
9. O'Neill (1974)	"Open space" vs. "conventional" schools, as determined by both architecture and observers' ratings of classroom flexibility and teacher directiveness	96 Grade 4 girls in 3 open space and 3 conventional schools in a white, middle-class suburban Illinois community; on the basis of prior testing of 139 Ss, 16 Ss were selected from each school, 4 Ss in each cell of a design with high and low convergent ability (California Achievement Tests) and high and low divergent ability (Wallach & Kogan creativity tasks)	Uses for Things (Guilford, 1959) and Picture Meanings (Wallach & Kogan, 1965)--two tests of divergent ability	No significant differences overall; in open schools, high creativity was associated with high self-esteem; in conventional schools, high creativity was associated with low self-esteem
10. Owen (1974)	"Open" vs. "traditional"	Middle school pupils, matched for IQ	Creativity test (not specified)	Open better
11. Ramey & Piper (1974)	"Open" vs. "traditional" classrooms	30 pupils (10 each from Grades 1, 4, and 8) in each of two private Protestant schools (one open, one traditional) in Detriot, Michigan	Torrance Tests of Creative Thinking (both verbal and figural components)	Mixed results: Open better on figural test; traditional better on verbal test

Table 4: CREATIVITY

Study	Criteria for School Selection	Sample	Measures	Results
12. Richards & Bolton (1971)	"Discovery approach" (open) vs. "traditional methods" vs. "balance between traditional and discovery methods" in mathematics teaching	265 fourth year (i.e., Grade 5) pupils in three junior schools in the Northeast of England	Circles Test and Consequences Test from Torrance Tests of Creative Thinking; Uses for Things Test (Guilford, 1967); Pattern Meanings Test (Wallach & Kogan, 1965); and Make-up Problems Test (Getzels & Jackson, 1962)	Open better than either traditional or "balanced", with traditional scoring lowest
13. Ruedi (1974)	"Open environment" vs. "traditional" classrooms, as determined by school district labeling, the Walberg & Thomas Open Education Teacher Questionnaire, and ratings of two observers	Pupils in Grades 4, 5, and 6 in open and traditional schools in Decatur, Illinois	Torrance Figural Test of Creative Thinking; Christensen-Guilford Ideational Fluency Test (IQ controlled for by Quick Word Test)	Mixed results: Open better on one question in Grade 4 and one question in Grade 6
14. Shapiro (1971)	Bank Street Follow Through program (open) vs. neighborhood non-Follow Through comparison classrooms (traditional); differences between approaches determined by extensive classroom observations and teacher interviews	151 black, low SES, Grade 1 pupils in one Follow Through classroom and one comparison classroom in each of three locations: Tuskeegee, Alabama; Brooklyn, N.Y.; and Philadelphia, Pennsylvania	Line Drawings and Instances techniques, from Wallach & Kogan (1965)	Mixed results: Generally, no significant differences, open better on one measure in one city (Brooklyn)

Table 4: CREATIVITY

	Study	*Criteria for School Selection*	*Sample*	*Measures*	*Results*
15.	Shapiro (1972)	"Creative" (open) vs. "traditional" schools, as determined by teacher responses to Organizational Climate Index and an Inventory of Beliefs, pupil responses to a Classroom Creativity Observation Schedule and an Organizational Climate in the Classroom Test, and "the judgment of experts"	Pupils in four creative" (open) and four traditional elementary schools	Torrance's Test of Creative Thinking	Open better
16.	Sullivan (1974)	"Open" vs. "traditional" classrooms, as determined by observations and the Torrance Creative Activities Check List	48 Grade 5 pupils in a suburban Pennsylvania school district; 22 from an open classroom and 26 from a traditional classroom	Measures of Fluency of Words, Fluency of Ideas, Invention, and Predictability from Tate, Stanier, and Harootunian (1959) and Sullivan (1970); measures of originality in creative writing (unusual words, originality of topic, variety of sentence structure, vivid passages), from Torrances Originality Scale for Stories (Minnesota Test of Creative Thinking)	Mixed results: Creative Thinking--open better on Fluency of Words and Invention; no significant differences on Fluency of Ideas and Predictability; Creative Writing--open better on variety of sentence structure and vivid passages; no significant differences on unusual words or originality of topic

Table 4: CREATIVITY

	Study	*Criteria for School Selection*	*Sample*	*Measures*	*Results*
17.	Traub, Weiss, Fisher, & Musella (1972)	"*Programmatic openness*" ("less open" vs. "more open," as determined by the 29-item Dimensions of Schooling Questionnaire administered to teachers) and *"architectural openness"*--"open-space" vs. "closed space" (self-contained classrooms) vs. "mixed space" (closed space buildings with open space additions)	8- and 11-year-old pupils in 6 suburban schools in Ontario, Canada	Torrance Tests of Creative Thinking	Mixed results: "Less open" (traditional) better on three tests of verbal creativity (fluency, flexibility, and originality); "No clear and consistent patterns" for four figural scales (fluency, flexibility, originality, and creativity)
18.	Wilson, Langevin, & Stuckey (1972)	"Open plan philosophy" vs. "traditional classroom approach"	11- and 12-year-old pupils from four schools in middle-class suburban Toronto (104 pupils from two open schools and 59 pupils from two traditional schools)	Four of the Minnesota Tests of Creativity; Product Improvement, Unusual Uses, Figure Completion, and Circles, scored for fluency, flexibility, originality, and elaboration	Mixed results: Pupils in the open school which had empolyed the open plan philosophy for *six* years scored *higher* than the traditional control group on most of the creativity measures; pupils in the open school which had employed the

Table 4: CREATIVITY

Study	Criteria for School Selection	Sample	Measures	Results
				open plan philosophy for only *one* year generally scored *lower* than the traditional control group
19. York County Board of Education (1973)	"Open plan" vs. "architecturally conventional" schools	Pupils in Grades 2 and 5 in two open plan and two traditional schools matched for size, location, and SES in Ontario, Canada	"Standardized tests of creativity"	Mixed results: "A few differences" (unspecified), but "no systematic differences overall"

Table 5: INDEPENDENCE AND CONFORMITY

Study	*Criteria for School Selection*	*Sample*	*Measures*	*Results*
1. Bengis (1974)	"Open classroom schooling" vs. "traditional schooling"	56 Grade 3 pupils from two New York City schools, 30 from a traditional classroom and 26 from an open classroom	Abelson & Lesser's Persuasibility Booklet (persuasibility scored as the number of agreements between communicator and child	Open "more autonomous and more independent in their thinking
2. Bleier, Groveman, Kuntz & Mueller (1972)	"Open" vs. "traditional" classrooms	36 Grade 3 pupils in one open and one traditional classroom, comparable with regard to age, sex distribution, IQ, SES (middle class), ethnic background, and Metropolitan Achievement Test scores, in a public elementary school in the Boston area	Multiple choice test of common knowledge, with responses supposedly written by 6th graders already penciled into the test booklets; "Yielding to influence" was measured by the number of responses comformed to incorrect penciled-in responses	Open less conforming (i.e., traditional showed more yielding to influence
3. Butson (1975)	"Alternative elementary school built on the principle of openness" vs. "local conventional elementary schools	Grade K-6 pupils in one open school and four conventional schools in rural Minnesota	Self-Reliance subtest of the California Test of Personality (pre and post-tests)	Open showed higher mean gain in self-reliance

Table 5: INDEPENDENCE AND CONFORMITY

Study	Criteria for School Selection	Sample	Measures	Results
4. Carbonari (1971)	"Open concept" vs. "traditional" schools	(Not specified)	(Not specified)	Open more independent and self-reliant
5. Cronemeyer (1975)	"Open, informal classroom"	51 Grade 6 pupils in Las Cruces, New Mexico (no control or comparison group)	Dependence Proneness Scale-Form One (pre-test followed by post-test after "a semester in the open classroom environment")	Mixed results: In the open classroom, "high dependent students tended to become more independent, while low dependent, while low dependent students increased in dependency"
6. Duckworth (1971)	Open classrooms participating in Education Development Center's African Primary Science Program vs. more traditional comparison classes	12 children, aged 8 to 13, from each of 15 experimental (open) classes and 13 comparison classes from rural and village schools in Kenya	Observations of sessions in which groups of children made constructions with building and play materials	Open more independent and self-confident--spent less time watching other children
7. Firester (1974)	"Open vs. traditional classroom structure," as determined by "extended structured and unstructured observations"	Grade 2 pupils (27 boys, 27 girls) in each of two schools (one open, one traditional) in a small homogeneous, middle class community	California Test of Personality (AI Scale, Primary Edition); Aronson Graphic Expressions Test	Traditional "obtained slightly higher, statistically significant independence scores"

Table 5: INDEPENDENCE AND CONFORMITY

Study	*Criteria for School Selection*	*Sample*	*Measures*	*Results*
8. Grapko (1972)	"Open space" vs. "traditional classroom structure"	Children in two Ontario schools matched on SES	Child Study Security Test	No significant difference in security or independence
9. McPartland & Epstein (1975a)	Variations in "'openness' of school's instructional program" and "authority systems of classrooms"	5,6661 students in 4 secondary grades of 16 schools (part of a larger study including 1,700 elementary school children from 23 schools) in a Maryland suburban district	Measure of "student self-reliance"	Open more self-reliant
10. Mensh & Mason (1951)	"Progressive school" ("cooperative, non-competitive living...with the aim of having the individual student develop his own capabilities, directed by his initiative and interest") vs. "traditional school" ("emphasis upon scholastic attainment...teams compete for academic grades...set rules for proper conduct... authoritarian leadership")	185 girls, grades 5-8, from wealthy socio-economic backgrounds, 75 from a progressive public, co-educational school and 110 from a traditional private girls' school	Rosenzweig Picture-Frustration Study, Group Conformity Rating	Progressive (open) showed less social conformity (in response to frustrating situations)

Table 5: INDEPENDENCE AND CONFORMITY

	Study	*Criteria for School Selection*	*Sample*	*Measures*	*Results*
11.	Myers (1971)	"Open area" vs. "self-contained" classrooms	271 pupils, Grades 3-7, in self-contained classrooms in a traditional school and 62 pupils, Grades 3-7, in a new open area school in the Prince George School District, British Columbia, Canada	Ideal Teacher Checklist (Torrance & Myers, 1970), measure of child's desire for autonomy	Open expressed more desire for autonomy and less need to depend upon teachers
12.	Rentfrow, Goldupp & Hurt (1973)	"Open classroom program" (Tucson Early Education Model) vs. nonopen "comparison classrooms"	Children in 8 Head Start classes in a middle-sized Great Plains community, 6 open classrooms following the Tucson Early Education Model and 2 comparison classrooms using "locally implemented curriculum"	Classroom Attitude Observation Schedule--observations of amount of "inappropriate behavior" (hitting, interfering, yelling, throwing, leaving room without permission) when teacher is present in or absent from the classroom	Open children engaged in significantly less inappropriate behavior when teachers were absent (no differences were found between classroom types when teachers were present), suggesting greater independence for open children

Table 5: INDEPENDENCE AND CONFORMITY

Study	Criteria for School Selection	Sample	Measures	Results
13. Rothschild (1975)	"Open" vs. "individualized" vs. "traditional" classrooms, as determined by two observers' ratings on a Classroom Observation Instrument (derived from Walberg & Thomas' rating scale) and a classroom interaction mapping procedure	120 Grade 1 and 120 Grade 3 pupils in 12 classrooms in 5 schools in white, upper-middle class suburban Connecticut communities	Experimental procedures (the Zigler & Yando, 1972, marble-dropping game and the Patel & Gordon, 1970, "yielding to influence" procedure) designed to measure the child's tendency to rely upon his own resources or to imitate adults and peers	Mixed results: No significant differences between school types in imitation of adults; open were less imitative of peers (i.e., more self-reliant) in Grade 1, though no differences were found in Grade 3
14. Spivack (1973)	"A school that would well represent the informal setting...a typical, English open classroom" vs. "the traditional classroom setting	132 children aged 9 to 11 attending an open junior school in Reading, England (6 boys and 7 girls rated by each of 11 teachers), compared to a large sample of traditional school children in the U.S. and France	Devereux Elementary School Behavior Rating Scale (a 47-item teacher rating scale to assess the frequency of occurrence of different child behaviors in the classroom)	Open better: "Independence of mind" (i.e., lack of reliance on externals) is more highly correlated with "everyday classroom comprehension" in the open classroom than in the traditional classroom

Table 5: INDEPENDENCE AND CONFORMITY

	Study	*Criteria for School Selection*	*Sample*	*Measures*	*Results*
15.	Stallings (1974)	"More open, interdisciplinary classrooms" ("wide variety of activities and materials...children can select their own groupings and engage in activities without adults") vs. "more academically oriented classrooms" ("high rate of drill, practice and praise")	20 Grade 1 and 20 Grade 3 classrooms for each of 7 Follow Through sponsors, at five or more sites per sponsor; Follow Through models, ranging from open classroom to behavior modification, were compared with each other and with traditional non-Follow Through classrooms	Classroom observation of independence (defined as children engaged in tasks without adults)	Open children more independent
16.	Sullivan (1974)	"Open" vs. "traditional" classrooms, as determined by observations and the Torrance Creative Activities Check List	48 Grade 5 pupils in a suburban Pennsylvania school district: 22 from an open classroom and 26 from a traditional classroom	16-item questionnaire assessing "independent decision-making in performing tasks"	Open children significantly more independent and self-reliant
17.	Traub, Weiss & Fisher (1974)	*"Programmatic openness"* ("less open" vs. "more open," as determined by the 29-item Dimensions of Schooling Questionnaire administered to teachers) and *"architectural openness"*--"open space" vs. "closed space" (self-contained classrooms) vs. "mixed space" (closed space buildings with open space additions)	11-year-old pupils in 6 suburban schools in Ontaria, Canada	Self-report questionnaire assessing "independence, initiative, autonomy, and responsibility to self (or willingness to act in accordance with one's own values as opposed to the values and ideals of others)"	Open more independent (both programmatic and architectural openness were associated with greater initiative, responsibility to self, and autonomy)

Table 5: INDEPENDENCE AND CONFORMITY

	Study	*Criteria for School Selection*	*Sample*	*Measures*	*Results*
18.	Trotta (1973)	"Open class" vs. "traditional class" educational program	138 open class and 160 traditional class pupils in Grades 3, 4, and 5	Ideal Teacher Checklist (measure of autonomy)	No significant difference in autonomy
19.	York County Board of Education (1970)	"Open plan" vs. "control" (traditional) elementary schools	4 open plan and 3 control elementary schools in Ontario, Canada	Day-long classroom observations of random samples of pupils by an observation team of 7 principals and 2 master teachers	Open classroom children showed evidence of "initiating activities that reflect their personal interests" and "displaying personal responsibility"

Table 6: CURIOSITY

Study	*Criteria for School Selection*	*Sample*	*Measures*	*Results*
1. Corlis & Weiss (1973)	*"Programmatic openness"* ("less open" vs. "more open," as determined by the 29-item Dimensions of Schooling Questionnaire administered to teachers) and *"architectural openness"*--"open space" vs. "closed space (self-contained classrooms) vs. "mixed space" (closed space buildings with open space additions)	237 11-year-old pupils in 6 schools from a county parochial school board in Ontario	Non-Verbal Curiosity Test: pairs of tasks from which the S must choose to perform either the *curiosity* task ("a novel, strange, incongrous and/or complex situation for which a minimum of instruction and no evidence of expected outcome is provided") or the *non-curiosity* task ("a comparatively rote familiar task with clear, concise instructions, a clearly expected outcome, and a clearly defined external reward"); quality of curiosity behavior measured by a 5-point rating scale	"Mixed space" better than either "open space" or "closed space"; "Higher levels of curiosity behavior are associated with *moderate* amounts of program openness"

Table 6: CURIOSITY

Study	*Criteria for School Selection*	*Sample*	*Measures*	*Results*
2. Day (1974)	"Open plan" vs. "traditional" schools	198 pupils in Grades 2-4 in two open and two traditional schools matched for size, location, and SES in Ontario, Canada	(Unspecified)	"No consistent differences"
3. Glinsky (1973)	"Open classes" vs. "more restricted environments"	Fourth grade pupils in nine classrooms	Classroom observations of question-asking behavior	Open better (i.e., ask more questions)
4. Jeffreys (1970)	"Pupil-Centered" (open space, ungraded, team teaching, individualized instruction) vs. "conventional" school; pupil centeredness determined by systematic observation of pupil and teacher behaviors	Grade 3 and 5 pupils in one "open" and one "conventional" school	Observation of information-seeking behavior in the classroom; measure of amount of involvement in after-school activities	Mixed results: Open children showed more initiation of verbal interaction with teachers (i.e., greater classroom information-seeking), but no differences were found in after-school activity involvement (i.e., out-of-school information-seeking)

Table 6: CURIOSITY

Study	Criteria for School Selection	Sample	Measures	Results
5. Rothschild (1975)	"Open" vs. "individualized" vs. "traditional" classrooms, as determined by two observers' ratings on a Classroom Observation Instrument (derived from Walberg & Thomas' Rating Scale) and a classroom interaction mapping procedure	120 Grade 1 and 120 Grade 3 pupils in 12 classrooms in 5 schools in white, upper-middle class suburban Connecticut communities	Two experimental tasks from the Harter & Zigler (1974) effectance motivation battery: a pictorial curiosity task (interest in novel stimuli) and a paper and pencil maze task (designed to measure change-seeking behavior)	Open better
6. Stallings (1974)	"More open, interdisciplinary classrooms" ("wide variety of activities and materials...children can select their own groupings and engage in activities without adults") vs. "more academically oriented classrooms" ("high rate of drill, practice and praise")	20 Grade 1 and 20 Grade 3 classrooms for each of seven Follow Through sponsors, at five or more sites per sponsor. Follow Through models, ranging from open classrooms to behavior modification, were compared with each other and with traditional non-Follow Through classrooms	Classroom Observations of question-asking behavior	Open better (i.e., ask more questions)

Table 6: CURIOSITY

Study	Criteria for School Selection	Sample	Measures	Results
7. Stork (1973)	"Open classroom" vs. "traditional" schools	Grade 3 pupils, 27 in an open school and 30 in a traditional school, in Hamden, Connecticut	Shortened versions of the Maw & Maw (1968) "Self Appraisal of Curiosity" and Penney & McCann (1964) "Children's Reactive Curiosity Scale," plus interview questions (from Harter, 1973) assessing amount of curiosity	Mixed results: No significant differences on the two standardized tests; Open better in interview
8. Traub, Weiss, Fisher, & Musella (1972)	*"Programmatic openness"* ("less open" vs. "more open, as determined by the 29-item Dimensions of School Questionnaire administered to teachers) and *"architectural openness"* ("open space" vs. "closed space" (self-contained classrooms) vs. "mixed space" (closed space buildings with open space additions)	11-year-old pupils in 6 suburban schools in Ontario, Canada	Day Specific Curiosity Inventory; Non-verbal Curiosity Test (Corlis & Weiss, 1973)	Mixed results: "No consistent trends"; mixed space schools better than open space schools on Non-verbal Test

Table 6: CURIOSITY

	Study	*Criteria for School Selection*	*Sample*	*Measures*	*Results*
9.	Wilson, Langevin, & Stuckey (1972)	"Open plan philosophy" vs. "traditional classroom approach"	11- and 12-year-old pupils from four schools in middle-class, suburban Toronto (104 pupils from two open schools and 59 pupils from two traditional schools)	Specific Curiosity Questionnaire (Day, 1969) and Reactive Curiosity Questionnaire (Penney & McCann, 1964)	No significant differences
10.	York County Board of Education, Aurora, Ontario (1970)	"Open plan" vs. "control" (traditional) elementary schools	4 open plan and 3 control elementary schools in Ontario, Canada	Day-long classroom observations of random samples of pupils by an observation team of seven principals and two master teachers	Open better (i.e., more question-asking; greater "spirit of inquiry")
11.	York County Board of Education, Aurora, Ontario (1973)	"Open plan" vs. "architecturally conventional" schools	Pupils in Grades 2 and 5 in 2 open plan and 2 traditional schools matched for size, location and SES in Ontario, Canada	"Standardized tests of curiosity" (unspecified)	Mixed results: "No systematic differences overall" ("a few differences" unspecified)

Table 7: ADJUSTMENT AND ANXIETY

Study	*Criteria for School Selection*	*Sample*	*Measures*	*Results*
1. Butson (1975)	"Alternative elementary school built on the principle of openness" vs. "local conventional elementary schools"	Grade K-6 pupils in one open school and four conventional school in rural Minnesota	California Test of Personality (15 sub-tests; pre- and post-tests)	*Anxiety:* Open better (i.e., significantly greater mean gains) on the Freedom Form Nervous Symptoms Sub-test;* *Adjustment:* Mixed results: Open better (i.e., significantly greater mean gains) on Total Personal Adjustment, Total Adjustment, and Feeling of Belonging sub-tests in Grades K-3; but traditional better on those sub-tests in Grades 4-6
2. Elkind et al. (1973)	Children attending the World of Inquiry School (open classroom program) vs. a matched control group of children taken from the World of Inquiry waiting list and attending more traditional schools	24 matched pairs of World of Inquiry and control children, tested once in 1970-71 and again in 1971-72, Rochester, New Yor-	Sarason Test Anxiety Questionnaire	Open better in both testings (i.e., less anxious)

Table 7: ADJUSTMENT AND ANXIETY

	Study	*Criteria for School Selection*	*Sample*	*Measures*	*Results*
3.	Epstein (1974)	"Open environment" vs. "traditional" schools, as determined by student responses to survey questionnaires	3,998 pupils in Grades 6, 8, and 11 in 13 schools	Survey Questionnaires assessing anxiety about school and behavioral adjustment; multivariate analysis involving "openness of family" as well as "openness of school"	Mixed results: *Anxiety:* Generally, no significant differences, though in Grade 8, "students from more open families who have attended open schools for a longer duration are significantly less anxious about school" *Adjustment:* Generally, more behavioral adjustment incidents reported in open schools, but in Grades 8 and 11, "students from more open families who have attended open schools for a longer duration have no more adjustment incidents than students in more traditional schools"
4.	Feeney, Hochschild, Joy, & Sadow (1974)	"Open" vs. "high transitional" vs. "low transitional" (traditional) classrooms, as determined by classroom observation and teacher interview assessment of materials available to children, number of activity cen-	11 open, 17 "high transitional," and 11 "low transitional" (traditional) classrooms in Buffalo, New York	Pupil test anxiety questionnaire; teacher ratings of number and type of maladjusted children in their classes and descriptions of	*Anxiety:* No significant differences *Adjustment:* Open better (fewer maladjusted children were reported in open than in transitional or traditional classrooms); of the children considered maladjusted, simi-

Table 7: ADJUSTMENT AND ANXIETY

Study	*Criteria for School Selection*	*Sample*	*Measures*	*Results*
	ters, student groupings, variety and scheduling of activities, and degree of student choice		methods used to deal with those children	lar proportions of disruptive, dependent, and and withdrawn children were reported in the three types of classrooms; open teachers utilized techniques involving more student choice and less punishment than other teachers in dealing with dependent and disruptive children
5. Godde (1972)	"Individual progression curriculum organization" (open) vs. "traditional curriculum organization"	Kindergarten and Grade 1 pupils in two schools	Bellack Apperception Test	Open better (i.e., higher score in personal adjustment)
6. Gooch & Kellmer Pringle (1966)	"Formal traditional approach" vs. "informal progressive approach"	Secondary school pupils (age 15), 37 of whom had attended a traditional junior school and 44 of whom had attended a progressive ("open") junior school in the English Midlands four years prior to testing	Questionnaires completed by children and their mothers; structured individual interviews with children; school reports from teachers and headmasters	Mixed results: Traditional girls and progressive (open) boys had high maladjustment ratings

Table 7: ADJUSTMENT AND ANXIETY

Study	*Criteria for School Selection*	*Sample*	*Measures*	*Results*
7. Jeffreys (1970)	"Pupil-centered" (open space, ungraded, team teaching, individualized instruction) vs. "conventional" school; pupil-centeredness determined by systematic observation of pupil and teacher behaviors	Grade 3 and 5 pupils in one "open" and one "conventional" school	"Reported adjustment"	No significant differences
8. Kellmer Pringle & Cox (1963)	"Child-centered, progressive" (open) school (emphasis on "cooperation and the realization of each individual's potentiality") vs. "adult-directed, traditional" school (emphasis on "competition, streaming, and class teaching")	235 fourth-year pupils in two junior schools in the English Midlands (58 boys and 58 girls in a progressive school and 60 boys and 59 girls in a traditional school)	Sarason's Test Anxiety and General Anxiety Scales	Traditional better (i.e., less anxious)
9. LaForge (1972)	"Open space designed building" vs. "traditionally designed building"	400 pupils in Grades 6-8 from one open space and one traditional school, matched for SES, student achievement levels, teacher attitude, and curriculum	Children's Personality Questionnaire (for Grade 6 Ss) and High School Personality Questionnaire (for Grade 7 and 8 Ss) --"pencil and paper personality tests developed by the Institute for Personality and Ability Testing (IPAT)"	Mixed Results: No significant difference in "total personality," but open space pupils were "more tender-minded and sensitive in terms of sympathy for the need of others"

Table 7: ADJUSTMENT AND ANXIETY

Study	Criteria for School Selection	Sample	Measures	Results
10. McCallum (1971)	"Open-space team teaching" vs. "traditional" elementary schools	480 pupils in 6 grades from four schools in a suburban area near Denver, Colorado	Interviews with children; questionnaires completed by teachers and parents; children's cumulative record files	No significant differences between school types in the kinds of problems children have, the depth of the problem experience, the duration of the problems, or in who helps them with their problems
11. Mensh & Mason (1951)	"Progressive school" ("cooperative, non-competitive living...with the aim of having the individual student develop his own capabilities, directed by his initiative and interest") vs. "traditional school" ("emphasis upon scholastic attainment... teams compete for academic grades...set rules of proper conduct...authoritarian leadership")	185 girls, grades 5-8, from wealthy socio-economic backgrounds, 75 from a progressive public, coeducational school and 110 from a traditional private girls' school	Rogers Test of Personality Adjustment (measure of personal, social, and family adjustment)	No significant differences
12. Moore (1974)	"Open" vs. "traditional" classes	136 Grade 3 pupils (65 open and 71 traditional) and 230 Grade 4 pupils (118 open and 112 traditional) from five elementary schools in Romeoville, Illinois	Sarason's General Anxiety and Test Anxiety Scales for Children	Traditional better (i.e., less anxious)

Table 7: ADJUSTMENT AND ANXIETY

Study	Criteria for School Selection	Sample	Measures	Results
13. Spivack (1973)	"A school that would well represent the informal setting...a typical, English open classroom" vs. "the traditional classroom setting"	132 children aged 9 to 11 attending an open junior school in Reading, England (6 boys and 6 girls rated by each of 11 teachers), compared to a larger sample of traditional school children in the U.S. and France	Devereux Elementary School Behavior Rating Scale (a 47-item teacher rating scale to assess the frequency of occurrence of different child behaviors in the classroom); teacher grades in reading and arithmetic and children's standardized reading test scores	Mixed results: As in the traditional classroom, the higher achieving pupil in the open classroom "exhibits (more) independence of mind and personal involvement, and is seldom impulsively irrelevant, excessively anxious and inattentive;" however, in the open classroom "obstreperousness and negative feelings expressed to the teacher do not interfere with nor apparently reflect lack of academic achievement, as is the case in the traditional classroom"
14. Wren (1972)	"Open area" vs. "traditional self-contained classrooms"	Pupils in Grades 3, 4, and 5 in one elementary school	Children's Manifest Anxiety Scale	No significant differences in anxiety

Table 8: LOCUS OF CONTROL

Study	*Criteria for School Selection*	*Sample*	*Measures*	*Results*
1. Eisenberger (1972)	"Open" vs. "traditional" classrooms	Navajo kindergarten children in open and traditional classrooms in Bureau of Indian Affairs Boarding Schools	Interviews	Open better (i.e., "far exceeded" traditional children "in development of internal control")
2. Feeney, Hochschild, Joy & Sadow (1974)	"Open" vs. "high transitional" vs. "low transitional" (traditional) classrooms, as determined by classroom observation and teacher interview assessment of materials available to children, number of activity centers, student groupings, variety and scheduling of activities, and degree of student choice	11 open, 17 "high" transitional," and 11 "low transitional" (traditional) classrooms in Buffalo, New York	Measure of child's perception of his responsibility for "both the positive and negative things that might happen to him in academic, school-related situations"	No significant differences
3. Francis (1973)	"Open" vs. "traditional structured" classrooms, selected "in conjunction with the assistant superintendents and curriculum directors" in two school systems. Teachers' agreement with the open education philosophy was assessed by their responses to Barth's "Assumptions	153 Grade 3 children (white, middle class, average age 9 years) from one open (N=31 boys, 28 girls) and one traditional (N= 27 boys, 19 girls) school in Knox County, Tennessee, and one open (N=18 boys, 12 girls) and one tra-	Battle & Rotter (1963) Picture Test of Internal-External Control (all Ss); Crandall, Katkovsky, & Crandall (1965) Intellectual Achievement Responsibility (IAR) Questionnaire (Tennessee Ss only);	No significant differences (on any of the tests)

Table 8: LOCUS OF CONTROL

Study	Criteria for School Selection	Sample	Measures	Results
	about Learning and Knowledge" questionnaire, but this measure failed to differentiate teachers described as "open" from those described as "traditional"	ditional (N=10 boys, 12 girls) school in Hamden, Connecticut	Children's Nowicki-Strickland Internal-External Control Scale (1972) (Connecticut Ss only)	
4. Judd (1974)	"Open space" vs. "traditional" schools	315 Grade 6 pupils, 141 in 3 open-space schools and 174 in 3 traditional schools	Questionnaire (unspecified) measuring locus of control	No data reported on which school group was more internal; however, in open schools, high internal Ss had more positive attitudes toward school and self, while in traditional schools, high external Ss had more positive attitudes toward school and self
5. Knowles (1972)	"Open" ("featured free, exploratory, interest-centered behavior) vs. "structured" ("employing verbal reinforcement geared toward the acquisition of specific responses") vs. "traditional" classrooms	Black and white children attending "open" and "structured" Follow Through settings and a "traditional" non-Follow Through setting	Stephen-Delys Reinforcement Contingency Interview	Open better (i.e., more internal control) than either structured or traditional; (also, structured better than traditional)

Table 8: LOCUS OF CONTROL

Study	*Criteria for School Selection*	*Sample*	*Measures*	*Results*
6. Owen et al. (1974)	"Open" vs. "traditional"	Middle school pupils, matched for IQ	(Not specified)	No significant differences
7. Reiss & Dyhdalo (in press)	"Open space" vs. "conventional classes"	43 Grade 2 pupils in 3 open space and 3 conventional schools in Oak Park, Illinois	Stanford Preschool I-E Scale	No significant differences
8. Singh (1974)	"Open structure" vs. "traditional" classrooms, as determined by teacher responses to the Dopyera & Lay (1974) Open Program Structure Index	3 boys and 3 girls from each of 12 open and 12 traditional inner-city classrooms	Children's Locus of Control Test (Bailer, 1961)	Open better (i.e., more internal)
9. Stallings (1974)	"More open, more flexible classrooms" vs. "more highly structured classrooms"	20 Grade 1 and 20 Grade 3 classrooms for each of 7 Follow Through sponsors, at 5 or more sites per sponsor. Follow Through models, ranging from open classroom to behavior modification, were compared with each other and with traditional non-Follow Through classrooms	Intellectual Achievement Responsibility Success Scale	Mixed results: Open more internal re: success (i.e., "take responsibility for their own success but not for their failure"); Traditional more internal re: failure, (i.e., "take responsibility for their own failure, but attribute their success to their teacher's competence or other forces outside themselves")

Table 8: LOCUS OF CONTROL

	Study	*Criteria for School Selection*	*Sample*	*Measures*	*Results*
10.	Stowers (1974)	"Open plan" vs. "architecturally conventional" schools	Grade 6 pupils in 4 conventional and 4 open plan schools in a Washington, D.C. suburb	Intellectual Achievement Responsibility Questionnaire (Crandall, 1965)	Mixed results: Traditional more internal re: failure (other findings not reported)
11.	Trotta (1973)	"Open class" vs. "traditional class" educational program	138 open class and 160 traditional class pupils in Grades 3, 4, and 5	Intellectual Achievement Responsibility Questionnaire	Traditional better (i.e., more internal)

Table 9: COOPERATION

Study	*Criteria for School Selection*	*Sample*	*Measures*	*Results*
1. Duckworth (1971)	Open classrooms participating in Education Development Center's African Primary Science Program vs. more traditional comparison classes	12 children, aged 8 to 13, from each of 15 experimental (open) classes and 13 comparison classes from rural and village schools in Kenya	Observation of constructions made by children with a variety of building and play materials	Open better (better able "to collaborate and to build on each other's ideas in their work")
2. Feeney, Hochschild, Joy & Sadow (1974)	"Open" vs. "high transitional" vs. "low transitional" (traditional) classrooms, as determined by classroom observation and teacher interview assessment of materials available to children, number of activity centers, student groupings, variety and scheduling of activities, and degree of student choice	11 open, 17 "high transitional," and 11 "low transitional" (traditional) classrooms in Buffalo, N.Y.	"Cones-in-Bottle Task" (experimental task in which groups of 12 children must pull wooden cones out of a gallon bottle as quickly as possible); high scores obtained only when children cooperate and agree to take turns	Open better (more cooperative)
3. Rothschild (1975)	"Open" vs. "individualized" vs. "traditional" classrooms, as determined by two observers' ratings on a Classroom Observation Instrument (derived from Walberg & Thomas' rating scale) and a classroom interaction mapping procedure	120 Grade 1 and 120 Grade 3 pupils in 12 classrooms in 5 schools in white, upper-middle class suburban Connecticut communities	Nelson & Madsen (1969) string-pulling task (pairs of children either compete or cooperate to score points by pulling strings to move a pointer to a target)	No significant differences

Table 9: COOPERATION

Study	*Criteria for School Selection*	*Sample*	*Measures*	*Results*
4. Stallings (1974)	"More open, interdisciplinary classrooms" ("wide variety of activities and materials...children can select their own groupings and engage in activities without adults") vs. "more academically oriented classrooms" ("high rate of drill, practice, and praise")	20 Grade 1 and 20 Grade 3 classrooms for each of seven Follow Through sponsors, at five or more sites per sponsor. Follow Through models, ranging from open classroom to behavior modification, were compared with each other and with traditional non-Follow Through classrooms	Classroom observation of cooperation (defined as two or more children working together)	Open better ("cooperate more often")
5. Traub, Weiss, Fisher, Musella (1972)	*"Programmatic openness"* ("less open" vs. "more open," as determined by the 29-item Dimensions of Schooling Questionnaire administered to teachers) and *"architectural openness"*--"open space" vs. "closed space" (self-contained classrooms) vs. "mixed space" (closed space buildings with open space additions)	8- and 11-year-old pupils in 6 suburban schools in Ontario, Canada	Russell Sage Social Relations Test (group problem solving)	No significant differences

Classroom observation has provided another method for rating cooperative behavior in children; the study by Stallings (1974) reports greater amounts of cooperation occurring in open than in traditional classrooms. Since children are not as often *allowed* to work together in traditional classrooms, however, it is impossible to know if the Stallings findings really say anything about the social predilections of the children themselves or whether they simply reflect differences in classroom rules and procedures. More research in this area is needed before any firm conclusions about the effect of open classroom teaching on cooperation can be made.

OTHER VARIABLES

Involvement in After-School Activities

In his study of third- and fifth-grade children in a 'pupil-centered' open-space school and a conventional school, Jeffrey (1970) found a significantly greater number of 'open' school pupils reported as being involved in after-school activities. Gardner (1966) found no significant differences between open and traditional school groups in out-of-school interests at the infant school level (age 5 to 7), but did find the open school group superior in both breadth and depth of interests at the junior school level (age 7 to 11). Baker-Lunn (1970) investigated both interests and hobbies in 9- to 11-year-old children in English junior schools and found no significant differences in the patterns of favorite activities between the open (nonstreamed) and traditional (streamed groups.

Risk-Taking Behavior

Anifant (1972) employed three measures of risk-taking in a study of 120 sixth-, seventh-, and eighth-grade children, half of whom attended an open-space school and half of whom attended a traditional school. The open school children demonstrated more willingness to take risks in two of the tasks, the *Ring Toss Game* (chance-skill risk-taking) and the *Choice Dilemmas Procedure* (cognitive-judgmental risk-taking). The third task, the *Bead Game* (chance-chance risk-taking), failed to show any significant differences between school types.

Delay of Gratification

In a study of 389 fourth- and fifth-grade pupils attending open space and traditional classrooms in Oak Park, Illinois, Blumenthal and Reiss (1975) found no significant differences between classroom types in preference for delayed reward. Four different tests for delay of gratification were utilized, each consisting of a choice between an immediate smaller reward and a delayed, larger reward. The study was interpreted as demonstrating that open space environments do not, as feared by some critics, encourage

children to behave impulsively.

Persistence

In their study of persistence on difficult tasks, Dyhdalo and Reiss (1974) tested 180 second graders from three open space and three self-contained classes in Oak Park, Illinois. Children from the open space schools were found to persist about 35 percent longer in working on difficult block design puzzles than children from the self-contained classrooms. The open classroom group's superior performance was interpreted as possibly stemming from the emphasis in their schools on 'self-directed' learning. Interestingly, in a later account of this study (Reiss and Dyhdalo, in press), the investigators reported that, for the boys in their sample, persistence was more positively correlated with achievement test scores in open space than in conventional classrooms--a finding which they interpret as suggesting that nonpersistent boys may be adversely affected by the distraction of the open space environment and might be better off in traditional classrooms.

Persistence in task performance among open and traditional classroom children was also investigated by Gardner (1966), who obtained results which varied as a function of both the age of the children and the nature of the task. In one condition ("Concentration on Task of the Child's Own Choice"), the children were given a choice of a wide range of popular activities (e.g., playing games, writing, drawing, etc.) in which to engage during a one-hour period, and a measure was made of the maximum number of minutes spent by each child on any one occupation. At the infant school level (age 6), the open classroom children spent significantly longer on their chosen tasks than did the traditional classroom children. At the junior school level (age 10), however, there was no significant difference between open and traditional groups. Another experimental condition ("Concentration on an Uninteresting Task") was devised to test the hypothesis that the open classroom's greater emphasis on free choice may interfere with children's ability to persist on assigned tasks which are not particularly interesting to them. Infant school children were asked to copy pages from a reading book into a blank book; junior school children to make multiple copies of a paragraph of nonsense code words. The children were asked to work as long as they could and measures were made of how much time they actually spent on the task. For the infant school subjects, the open classroom group persisted significantly longer; at the junior school level, the results were mixed: of 12 pairs of schools, three open schools scored significantly higher in persistence, two open schools scored slightly higher (but apparently not significantly so), and two traditional schools scored significantly higher; in five pairs there were no significant differences.

Need for Achievement

Elkind et al. (1973) administered a modified version

of the *McClelland Need Achievement Test* to 24 children in the open classroom World of Inquiry School and a comparison group of 24 traditional classroom children. Children were presented with pictures selected from *Murray's Thematic Apperception Test* (TAT) and their reactions to the pictures were scored for achievement themes. The traditional classroom group scored significantly higher than the open classroom group. An opposite pattern of results was obtained, however, in the Gooch and Kellmer Pringle (1966) study of 15-year-old English children who had previously attended either progressive (open) or traditional junior schools. A sample of 42 children from the open group and 37 children from the traditional group were asked to write for 10 minutes on the subject "The Best Moment in My Life" and their essays were scored for mention of various themes, one of which was achievement. Achievement themes occurred in the stories of significantly more open than traditional school children.

Liveliness and Extroversion

Traub, Weiss and Fisher (1974) cite a study of Carbonari (1971) in which children in an 'open concept school' were found to be more lively and extroverted than children in traditional classes. In the absence of any specific information on how those characteristics were measured, however, the reported findings are difficult to interpret. If they are based on behavioral observations within the classroom settings, for example, then the finding of greater liveliness in the open school simply corroborates the anecdotal observations of many writers on open education. If the liveliness was rated in some out-of-classroom procedure, however, then the findings may suggest a more generalized type of enthusiasm transferred to tasks outside the school context.

Communication

In an effort to test the hypothesis that the increased opportunities for social interaction in an open classroom would result in superior communication skills, Rothschild (1975) administered a communication game task to pairs of first- and third-grade children from open, individualized, and traditional classrooms. Subjects were each given a game board divided into squares and a box of small toys and common objects which could be placed on the squares. Separated visually from each other by a large screen, they were instructed to "make their boards look the same" by communicating verbally with each other. Efficiency of communication scores were obtained by dividing the number of correct matches by the number of seconds required to complete the game. Although no differences in communication skill were observed between the school types in Grade 1, the open classroom children did communicate significantly better than either the individualized or traditional classroom children in Grade 3.

Friendship Patterns

Three studies have investigated differences in friendship patterns between children in open and traditional schools. Gardner (1966) administered *Cunningham's Social Distance Scale* to children in six pairs of English junior schools. Each child was presented with a list of children in his class and asked to indicate his feelings about his classmates by making an X in one of five columns beside every name. The column headings ranged from "Would like him or her as my best friend" to "Would like to be with them now and again" to "Do not get on well with them at all," and columns were rated from one to five points in order of "amount of liking." Scores were obtained for each class by averaging the amount of points obtained by each child. Results indicated no consistent differences between classroom types in tendency to express like or dislike for other children.

Barker-Lunn (1970) used a similar procedure to study friendship patterns in a sample of 2,036 10- and 11-year-old children in 28 streamed (traditional) and unstreamed (open) junior schools in England. Each child was asked to identify his "best friend," the child he would "best like to work with," and the child he would "best like to play with." Children in both types of schools tended to choose those of similar ability and social class as friends, but a significantly greater number of mixed ability friendships were observed in nonstreamed (open) classes. In general, there was no difference between streamed and nonstreamed schools in the type of child who was most popular, but in classes in which teachers placed more emphasis on academic success, more children of below average ability were friendless or neglected by others.

In their study of friendship patterns in open space and traditional school children in Oak Park, Illinois (grades 3, 4, and 5; boys only), Signatur and Reiss (1974) found no significant differences between school types in the tendency to name as a friend someone who also chooses oneself as a friend or in percent of children not named as a friend by anyone. But children in the open space schools were found to have more altruistic relationships with their friends; specifically, they tended to complete a significantly larger number of boring arithmetic problems in order to help their friends earn a reward. About 10 percent more children in open space than traditional schools, however, reported having fewer than five friends. This finding was interpreted as indicating that the open space children had more difficulty forming friendships, although another interpretation, in view of the arithmetic problem experiment, could be that they had fewer, but closer, friends.

Peer Labeling

Franks, Wismer, and Dillon (1974) found that children in an open school used different kinds of standards in evaluating their classmates than did children in a traditional

school. Subjects were predominantly black, inner-city children in grades five to eight: 137 in an open school and 108 in a traditional school in a large, midwestern U.S. city. They were given a questionnaire in which they were asked to pick classmates they considered best and worst students and to explain their reasons for selecting them. As predicted by the investigators, children in the open school selected classmates primarily on the basis of *peer* interaction (e.g., "fighting, cheating, never pays attention to other people," or "helpful, listens to other people, gives others respect"), while children in the traditional school selected classmates primarily on the basis of interactions with *teachers* (e.g., "staying in or out of trouble, minding, being attentive"). Children in the open school were also found to use labeling in a less rigid, less uniform way (i.e., they chose more different people as "best" or "worst" and demonstrated less of a consensus in their choices). Since peer labels have been shown to be significantly associated with mental health-related variables such as self-esteem, the lack of consistency in peer labeling in the open school was interpreted as "less malevolent" than the pattern in the traditional school.

Interpersonal Trust

Moore (1974) administered the *Hochreich Children's Interpersonal Trust Scale* to a sample of 136 Grade 3 pupils (65 open and 71 traditional) and 230 Grade 4 pupils (118 open and 112 traditional) in five elementary schools in Romeoville, Illinois. Children in the traditional classrooms were found to be more trusting in Grade 3, but children in the open classrooms were found to be most trusting in Grade 4.

Flexibility

Two studies have set out to investigate whether the flexible, informal atmosphere of the open classroom may result in greater flexibility and open-mindedness in children. Kellmer, Pringle and McKenzie (1965) devised an 11-item flexibility/rigidity test in which subjects are first presented arithmetic problems solvable only by a 'set' solution and then a series of problems for which the set is not an appropriate solution (in some, the set is more difficult than an alternative solution; in one, the set will not work at all). A four-category scoring system was used to assess degree of 'set' or rigidity. Subjects were 101 boys and 110 girls in the fourth year of junior school (i.e., age 10 to 11) in one 'child-centered, progressive' and one 'adult-directed, traditional' school in the English Midlands. No overall difference in flexibility/rigidity was found between the two schools, but a significant interaction between school type and intelligence (*Terman-Merrill*) was obtained, with low ability children showing greater flexibility in the progressive (open) school than in the traditional school. As a possible explanation for this finding, the

authors suggest "it could be that a less competitive school environment reduces feelings of frustration and stress among the least able pupils and that it is this which leads to reduced rigidity in thinking." (p. 58)

Weiss (1971) investigated a different type of flexibility in his study of 1,063 third- to sixth-grade pupils in 40 open and traditional classrooms, using an adaptation of *Rokeach's Dogmatism Scale* to assess open- vs. closed-mindedness. Children in the open classrooms were found to be more open-minded (i.e., less dogmatic) than children in the traditional classrooms.

4

Summary: Many Unanswered Questions

The evaluation research on open classroom teaching is difficult to summarize because the findings are so mixed. For nearly every outcome variable assessed, more studies favored open classroom than traditional classroom children; however, studies showing no significant or consistent differences frequently outnumbered those favoring the open classrooms. The overall impression one gets from this research is that, compared to traditional education, the open classroom sometimes has measurable advantages for children, and that it sometimes appears to make no measurable difference, but that it rarely appears to produce any measurable harm. Even this very general impression must be qualified, however, because of the inconsistencies in defining 'open classroom' and other variations among the research studies, including age level of the subjects, number of years exposure to open education, and type of evaluation instruments utilized.

Before the question of how open-classroom teaching affects children can be fully answered, a great deal more research will have to be undertaken. Even as the number of outcome studies on open classroom teaching continues to mount, there is a growing feeling among open educators that alternative forms of evaluation are necessary. In 1973, the Workshop Center for Open Education at City College in New York published a collection of articles titled *Evaluation reconsidered: A position paper and supporting documents on evaluating change and changing evaluation* (Tobier, 1973). Two years later, following up on a 1972 conference on open education evaluation at the University of North Dakota, a series of papers under the general editorship of Vito Perrone was published, again proposing new approaches to the assessment of open classroom teaching (Carini, 1975; Engel, 1975; Hein, 1975; Patton, 1975; Perrone, Cohen and Martin, 1975).

Some of the criticisms which have been made of the more conventional approaches to evaluation deal specifically with the problems of standardized testing. Meier (1972, 1973, 1975), for example, has criticized standardized reading tests such as the commonly used *Metropolitan Applied Test* (MAT), for their middle-class bias, their emphasis on speed, the conventionality of thinking they require, the disadvantage they pose for children who lack confidence or emotional security in competitive situations, and the extent to which they tend to encourage teachers to "teach what the

test measures" with methods that are inappropriate for many children. Shapiro (1971, 1973a, 1973b) argues convincingly that the very nature of the test situation--formal, silent, dominated by adult demands--may discriminate against open classroom children who are less accustomed to such a context for school performance than traditional classroom children. Carrying Shapiro's point one step further, DeRivera (1973) asserts that "the whole format of testing, the very structure of it, contradicts the goals and structure of an open classroom." Among the contradictions:

1. *Open classroom:* children are encouraged or at least allowed to share, to converse, to help one another. *Testing situation:* no talking, no sharing, no helping one another.

2. *Open classroom:* children exercise and demonstrate their knowledge and skills in many different modes: verbally, by action, dramatics, writing, etc. *Testing situation:* the children's response mode is limited to reading, listening, and marking. Knowledge and skills which they are used to exercising in one mode have to be translated to the mode of response that fits the test.

3. *Open classroom:* generally flexibility is such that children can finish most tasks they begin and can go on to something else when finished. Children can move around the room. *Testing situation:* no moving on to the next task when finished, often not enough time to finish a task. Children must remain seated at a desk.

4. *Open classroom:* children generally work at many different tasks, so that comparisons are not easy and competition is not encouraged. *Testing situation:* children work on the same task at the same time so that comparisons are facilitated.

5. *Open classroom:* each child is viewed as a complex, unique individual, having strengths and weaknesses but essentially qualitatively different from others. *Testing situation:* quantitative differences between children are important, qualitative differences are lost. Success is defined by others' failures. (The 60th percentile means that 60 percent of the children in the grade score below.)

6. *Open classroom:* the child is given learning experiences designed to develop a self-image of a competent, effective, successful person.

This is considered an important attitude for effective learning. *Testing situation:* the very children (those who are weakest in skills) who need the support of a positive self-image in order to continue learning are discouraged and frustrated by failure.

7. *Open classroom:* thoughtful, critical thinking is encouraged. *Testing situation:* often random guessing is a more successful strategy than thoughtfulness since the tests are limited in time. Thoughtfulness is not rewarded.

8. *Open classroom:* intrinsic motivation (i.e., learning for learning's sake) is considered the most effective motivation for long-term learning. *Testing situation:* extrinsic motivation (i.e., learning for some outside reward) is encouraged; learning in order to pass the test.

But is it reasonable to conclude from these observations that standardized testing is inappropriate in the evaluation of open classroom teaching? Ultimately, the answer to that question lies within a much broader question: *What is the evaluation for?* One purpose of evaluation is to help teachers assess their students' progress: to see how much they've learned, to diagnose areas of strength and weakness, to point up needs for additional work. This may be called the *teaching* function of evaluation, as distinguished from two other important functions: the *scientific* function, and the *political* function.

TEACHING FUNCTION

It is in the area of the teaching function that much has been written critical of standardized testing. There no doubt is a great deal of truth to the contention that standardized achievement tests are not pleasant experiences for many school children, are not compatible with the philosophy and style of the open classroom, and often do not provide information which classroom teachers find particularly useful. Many writers have pointed out that if teachers want to keep track of children's progress, there are methods other than formal testing which can generate a more thorough and sensitive picture of their development. One of the most valuable of these methods is simply to keep folders of representative samples of each child's school work (DeRivera, 1973). Another is to keep notes, daily or periodically, on each child's activities, interests, language, social, emotional, and academic skill development. To facilitate this process, the teacher may wish to make use of special evaluation tasks or check lists, or may prefer to make careful anecdotal observations from time to time of

the child's experiences in school. Carini (1973, 1975) and Engel (1975) provide some particularly enlightening examples of the types of observation, description, and documentation procedures which can be utilized by classroom teachers to keep track of children's progress and development. (See also Dean, 1972, and Cohen and Stein, 1972.)

SCIENTIFIC FUNCTION

The scientific function of evaluation is concerned with description and assessment for the purpose of *understanding*. It may or may not provide information of immediate practical value to teachers, but should seek to answer important general questions about the process and effects of teaching. Standardized tests certainly have a place in scientific evaluation; indeed, it is within the scientific realm that standardized, statistically reliable, procedures make most sense, particularly if investigators are attempting to compare large samples of children who have been exposed to varying approaches to teaching.

But standardized tests of academic achievement provide only a limited type of information, and it is the overemphasis on them that has prompted vociferous criticism from proponents of open education. Significantly, in the evaluation studies reviewed for this paper, tests of academic achievement were utilized far more frequently than any other sorts of measures. Reading, writing, and arithmetical ability are certainly important in open as well as traditional classrooms, but there is clearly a need to develop reliable measures of other aspects of the child's response to school. Such important but methodologically difficult areas as self-concept, creativity, curiosity, independence, resourcefulness, and sociability are still in need of much further study.

Situational, observational, and experimental methodologies (as described, for example, by Bussis and Chittenden, 1970a, 1970b; Duckworth, 1971; and Rentfrow, Goldupp, and Hurt, 1973) as alternatives to the usual pencil and paper questionnaire measures are particularly deserving of further development. Research should be done on individual differences in children's response to open education. In addition, there is room for more descriptive study of the process of open classroom teaching, for careful analysis of teacher-pupil interactions, for close investigation of the way in which such key concepts as structure, freedom, and authority are actualized in open as compared to more traditional classrooms. (For examples of such descriptive studies, see Hirabayashi, 1974; Molony, 1972; and Travis, 1974.)

Clarification of the open classroom teacher's role is another area in which further research is needed. Recent efforts along this line have been made in the Open Corridor program in New York City, where teachers have kept logs "reflecting on their organizational changes and curricular developments" (Weber, 1973, p. 5) and where researchers from

the Educational Testing Service (Amarel, Bussis, and Chittenden, 1973) have carried out intensive teacher interviews to identify the various modifications in perceptions, beliefs, and attitudes which teachers undergo in moving towards a more open approach. Teacher interviews have also been an important part of the assessment strategy developed by the University of North Dakota's Center for Teaching and Learning, as have interviews with children and parents (Perrone, 1973).

Interview studies of parents' reactions to the open classroom approach are rare, and there is a need for more of them. The whole question of how parents form attitudes about their children's education and how they decide whether to endorse or oppose such innovative approaches as the open classroom is an extremely important one, for in this country parental support is essential for the survival of educational programs.

POLITICAL FUNCTION

When we begin to talk about research relating to the survival of programs, then we are moving into the political function of evaluation. Even when evaluation studies are undertaken ostensibly for scientific purposes, the results frequently are utilized for political purposes: i.e., to determine whether a program is 'good enough' to merit continuation.

In the political arena, in spite of the anti-achievement test sentiment of open classroom advocates, it is math and reading scores which often determine whether a program lives or dies. As was demonstrated earlier in this paper, the current research on academic achievement and open education does not show a clear pattern of results. Open classrooms occasionally score higher than traditional classrooms; they somewhat less often score lower than the traditional classrooms; frequently there are no significant differences. Research on many of the nonacademic variables is similarly inconclusive. More than likely, the future research findings will be just as self-contradictory. Supporters of the open classroom will always be able to find studies in favor of the open approach; detractors will always be able to find evidence against it. As with so many public policy issues, the decision about whether to support or not support the open classroom ultimately becomes one of values, not science. Jencks et al. (1972) concluded their book *Inequality* with the observation that since there was little concrete evidence that school--no matter how organized, funded, or constitued--affects future socio-economic standing, then it might as well be an enjoyable place to spend one's childhood:

> Instead of evaluating schools in terms of long-term effects on their alumni, which appear to be relatively uniform, we think it wiser to evaluate schools in

> terms of their immediate effects on teachers and students, which appear much more variable. Some schools are dull, depressing, even terrifying places, while others are lively, comfortable, and reassuring. If we think of school life as an end in itself rather than a means to some other end, such differences are enormously important. Eliminating these differences would not do much to make adults more equal, but it would do a great deal to make the quality of children's (and teachers') lives more equal (p. 256).

But there are others who would argue that making school fun does children a grave disservice, by denying them the opportunity to confront the harsh realities of the cruel, competitive world they must grow up to face. School, these critics say, should be a place for discipline, obedience, and hard work; fun is for after school.

Nowhere is the debate between these two points of view more clearly focused than in the current discussion of the 'back-to-basics' movement. In a direct challenge to the advocates of open, informal approaches to schooling, the back-to-basics advocates have been opening 'alternative schools' dedicated to 'quiet, orderliness, and the academic skills.' Recent newspaper accounts have ushered in the new movement with such headlines as: "Schools Returning to Basic Education" (Ryan, 1975a); "Math, Reading, Stressed Again" (Smith, 1975); "'New' School Has That Old Look" (Ryan, 1975b); "The Newest Innovation: Back to Basics" (Peterson, 1975a), followed by the inevitable counter-movement reports: "Liberals Defend Open Classes Against Back-to-Basics Forces" (Maeroff, 1975). Vociferous attacks against progressive trends in education have also occurred in England, most notably in a series of *Black Papers* (Cox and Dyson, 1971), and a collection of articles titled *Education: Threatened Standards* (Boyson, 1972), all of which have drawn equally vociferous counterattacks in the British press.

It is unlikely that more evaluation studies--however useful to teachers or scientists they may be--will ever resolve these debates. Vito Perrone has suggested rather optimistically that evaluation can serve to counter the back-to basics movement by "assisting people to understand what open education is all about" (Maeroff, 1975). But there seems little doubt that many opponents of open education already *do* understand it; they simply don't *like* it.

CONCLUSION

Evaluation is frequently described as being of two types: summative and formative (Bloom, Hastings, and Madaus, 1971). The summative type of evaluation seeks to 'sum up' the effects and outcomes of a program; the formative type of evaluation seeks to make ongoing assessments of the program's impact which feed back to the program's planners and imple-

menters to guide them in modifying and improving the program. While the summative evaluation on open classroom teaching is inconclusive, there is a great demand for continuing formative evaluation aimed at, in Carini's words, "providing an ever more responsive setting for children" (1973, p. 24).

At this time, the evidence from evaluation studies of the open classroom's effects on children is not sufficiently consistent to warrant an unqualified endorsement of that approach to teaching as decidedly superior to more traditional methods. But there certainly is enough evidence now to defend the idea that open classrooms should be supported as viable alternatives where teachers and parents are interested in having them.

Evaluation research can continue to play an important role both in improving the quality of ongoing open classroom programs and in documenting the relative strengths and weaknesses of the open and traditional approaches. While political decisions to support or not support open education will no doubt continue to be made regardless of the actual research evidence, there are still a great many unanswered questions about the open classroom which deserve to be answered, and there remains a need for more and better evaluation studies.

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CORRECTIONS

Psychological Effects of Open Classroom Teaching on Primary School Children: A Review of the Research, by Robert A. Horwitz

Proof-reading oversights led to the omission of an entire page of references from the final published text. The following references should be inserted on p. 61:

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Two other references were also inadvertently omitted:

(p. 65) Thorndike, R. L., Loftus, J. J., & Goldman, B. Observations of the behavior of children in activity and control schools. Journal of Experimental Education, 1941, 10(2), 138-145. (a)

(p. 67) Winett, R. A., & Edwards, S. M. An evaluation plan for educational innovations. Journal of Community Psychology, 1974, 2(4), 345-351.

In addition, three references appeared with partial omissions. They should read as follows:

(p. 54) Hopke, M. E. A comparison of basic skills' achievement level, attitude toward school, academic and global self-concepts of open concept primary grade school students and traditional self-contained classroom primary grade school students (Doctoral dissertation, University of Washington, 1974). Dissertation Abstracts International, 1975, 35, 7181A-7182A. (University Microfilms No. 75-3997).

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(p. 67) Wilson, F. S., Langevin, R., & Stuckey, T. Are pupils in the open plan school different? Journal of Educational Research, 1972, 66(3), 115-118.

Following is a list of additional corrections:

(p. 20iii) Crandall (1973)--Results should read: "No significant differences on 3 subtests; traditional better on 1 subtest."

(p. 20iv, p. 25, p. 29ii) Elkin et al. should be Elkind et al.

(p. 20vi) Greener (1972)--Measures should read "comprehension and concepts subtests" (not subjects).

(p. 20viii) Killough (1971)--Sample should read "divided equally by sex and year in school."

(p. 20x) Moore (1974)--Results for Grade 4 should read: "No significant differences on 9 subtests (vocabulary, reading comprehension, total reading, mathematics concepts & problems, total mathematics, language mechanics, total language, spelling, and total achievement)."

(p. 20xii) Richards & Bolton (1971)--Measures--"Early Problems Test" should be "Easy Problems Test."

(p. 20xvi) Traub, Weiss, Fisher & Husella should be Traub, Weiss, Fisher & Musella.

(p. 21) Greener (1972)--Pintner-Cunningham Primary Test (not Pinter).

(p. 29v) O'Neill (1974)--Results--semi-colon should follow the word "differences."

(p. 29xix) Wilson, Langevin & Stuckey (1972)--Results should read: "Open better."

(p. 29xxii) Haddon & Lytton (1968)--Criteria should read "consultation with lecturers" (not lectures).

(p. 29xxix) Cronemeyer (1975)--Results--Omit repetition of "while low dependent."

(p. 29xxxviii) Traub, Weiss, Fisher & Musella (1972)--Criteria--Dimensions of Schooling Questionnaire.

(p. 29xlvi) Francis (1973)--Sample should read "157 Grade 3 children."

(p. 30) Jeffrey (1970) should be Jeffreys (1970).

(p. 30, p. 44) Baker Lunn (1970) should be Barker Lunn (1970).

(p. 34) Kellmer, Pringle should be Kellmer Pringle.

(p. 36) Metropolitan Applied Test should be Metropolitan Achievement Test.

(p. 45, Brown & Precious, and p. 61, Ridgway & Lawton) Ward Luck Educational should be Ward Lock Educational.

(p. 50, Epstein) John Hopkins should be Johns Hopkins.

(p. 64) Spodek & Walbert should be Spodek & Walberg.